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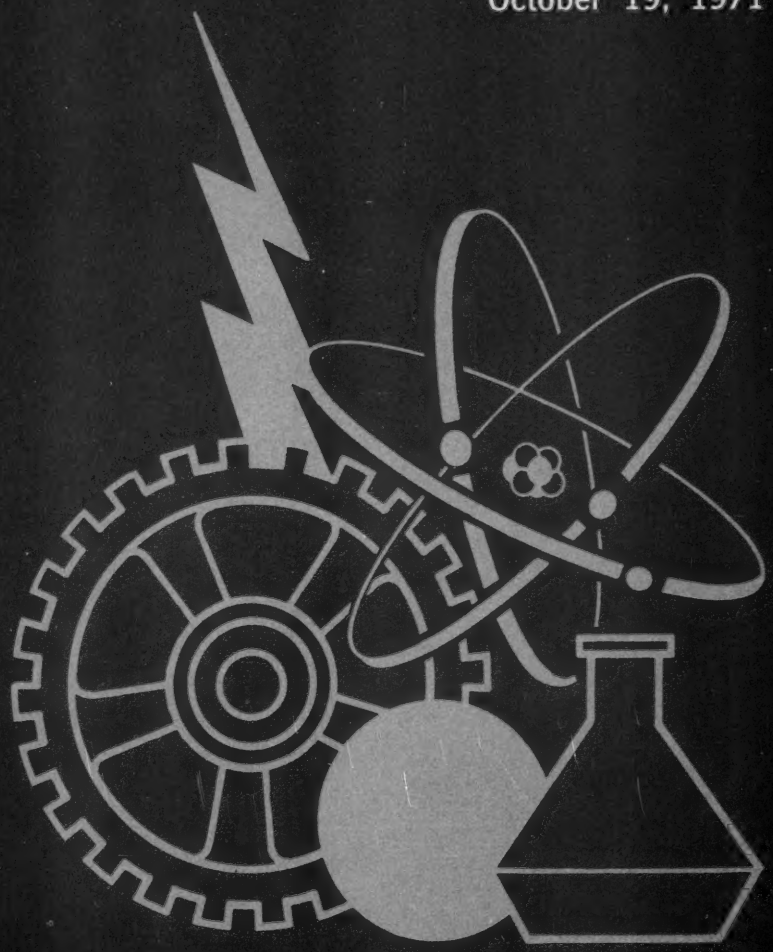

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October 19, 1971 Volume 891 Number 3

CONTENTS

	Page
Issue of October 19, 1971	885
Patents and Trademark Notices	
Recognition of Firms of Attorneys and Agents	886
Machine Search Service	886
Patent Suits	886
Patent Notices	
Certificates of Correction for the Week of October 19, 1971	888
Dedications	888
Disclaimers	888
Patents Available for Licensing or Sale	888
Condition of Patent Applications	890
Reissue Patents Granted	891
Patents Granted	
General and Mechanical	894
Electrical	1185
Design Patents Granted	1310
Index of Patentees	PI 1
Indices of Reissues and Designs	PI 44
Classification of	
Patents (Including Reissues)	PI 47
Designs	PI 49
Geographical Index of Residence of Inventors	
Patents (Including Reissues)	PI 50
Designs	PI 52

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PATENT OFFICE NOTICES

Recognition of Firms of Attorneys and Agents

The notice of August 5, 1971, appearing in the OFFICIAL GAZETTE September 7, 1971 (890 O.G. 2) is revised as follows.

The originally announced period terminating October 1, 1971, relating to appointments of firms of attorneys or agents, filed in the Patent Office after July 2, 1971, is hereby extended. Accordingly, until further notice, any power of attorney or authorization of agent naming a firm, received in the Patent Office after July 2, 1971, will be construed as a direction to consider the firm name and address as the correspondence address of the application.

ROBERT GOTTSCHALK,
Sept. 27, 1971. *Acting Commissioner of Patents.*

Machine Search Service

The Mechanized Search Service presently used by the Patent Office in making examiner searches in the field of Data Processing is offered for public use under the conditions and procedures prescribed herein.

This system is available as a punched card file for an initial fee of $40.00 each. The instruction manual "Search System Manual for the Field of Data Processing-ICIREPAT System DP" is included as part of the "package." A renewal fee of $35.00 per year entitles the subscriber to receive a set of cards for new issues.

This file which presently exists for mechanized searching consists of:

Field	Class	Subclass	File content [1]
Data processing	235	157	2,965 U.S. Patents.
	340	172.5	622 Literature articles.

[1] Approximate number of documents in the files as of June 30, 1971.

The scope and organization of this file is described in the publication "Search System Manual for the Field of Data Processing-ICIREPAT System DP."

A substantial portion of this publication is devoted to the technique of preparing the code sheet which is the means provided for expressing the search query for machine handling. Effective use of the mechanized search system and the achievement of competent results are dependent upon understanding and care in applying the coding information offered in this publication.

The Patent Office will accept requests for machine searches submitted on code sheets prepared in accordance with instructions contained in the aforedescribed publication. Requests received in any other form will not be accepted, as the Patent Office will not assume the responsibility for the formulation of a search query or the representation of a query in coded form. The Patent Office will, however, provide assistance to persons seeking aid in resolving specific questions which may arise in completing the code sheet prior to submitting the search request. The code sheet serves as the query form for searches on this system.

One or more Examiners have been designated to provide such assistance. A request for a conference on mechanized search questions in the field of Data Processing may be directed to the Supervisory Primary Examiner of Group Art Unit 237.

A search constitutes all of the machine and related operations required to retrieve from a data file, information contained therein which fulfills the search instructions represented on a code sheet. When several code sheets are required to cover the full search need, each code sheet will constitute a search. A search will be considered to be complete and proper even under circumstances in which proper operation of the system produces output representing documents which, while fulfilling the coded requirements, are determined by the user to lack pertinence or relevance in any or a sufficient degree; or, conversely, fails to produce an output.

The cost per search, which includes a list of the document references retrieved, is $5.00. Copies of all U.S. patent and non-patent literature references will be supplied, if requested as part of the search service, for additional cost at established rates, chargeable to a deposit account maintained by the search purchaser with the Patent Office.

Code sheets for the machine search file may be obtained from the Patent Office. Address request to the Patent Office, Office of Search Systems and Documentation, Washington, D.C., 20231.

After any necessary consultation with the Examiner in preparing the search query, address search requests together with the completed code sheet and fee to the Commissioner of Patents, Washington, D.C., 20231. Attention should be directed to the Office of Search Systems and Documentation, Office of the Adminstrator.

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,662,814, J. R. Swihart, METHOD AND COMPOSITION FOR CHEMICALLY POLISHING METALS; **3,072,515,** Von Smolinski, Berst and Alt, same; **3,530,017,** Mickelson, Roberts and Lancy, PROCESS FOR SURFACE TREATMENT OF METAL EXPANSION ALLOYS, **filed** Oct. 3, 1969, D.C., N.D. Tex. (Fort Worth), Doc. CA-4-1312, *The Diversey Corporation* v. *Panther Chemical Company.* Consent judgment, plaintiff is owner of patents in suit and defendant is permanently enjoined, May 6, 1971.

2,808,626, J. H. Sassano, OUTSIDE SLIDING WINDOW SHUTTER; **3,452,477,** same, EXTERIOR SLIDING WINDOW SHUTTERS, **filed** Aug. 28, 1970, D.C., S.D. Fla. (Miami), Doc. 70-1257, *Weather Control Shutters* v. *Bernardo Aluminum Fabricators, Inc.* Order, by stipulation, plaintiffs claim dismissed with prejudice; defendants' counterclaim dismissed without prejudice, May 11, 1971.

2,962,764, Trojanowski and Brandt, PROCESS FOR THE MANUFACTURE OF MOLDED ARTICLES; **2,962,767,** same, MOLDING PROCESS; **3,216,060,** same, APPARATUS FOR THE MANUFACTURE OF MOLDED ARTICLES; **3,556,833,** M. Nirenberg, APPARATUS FOR THE MANUFACTURE OF MULTICOLORED AND IRIDESCENT MOLDINGS, **filed** Feb. 23, 1971, D.C., W.D.N.Y. (Buffalo), Doc. C-1971-65, *Oceana International, Inc.* v. *Seymour I. Richman.* **Same, filed** Apr. 23, 1971, D.C., S.D.N.Y., Doc. 71-C-1812, *Oceana International Inc.* v. *Seymour I. Richman.*

2,962,767. (See 2,962,764.)

3,072,515. (See 2,662,814.)

3,216,060. (See 2,962,764.)

3,309,760. (See 3,317,320.)

3,317,320, R. L. Reber, DUO RESIST PROCESS; **3,401,306,** Bolvin and Bolan, REVERSE BIAS SECOND BREAKDOWN PROTECTOR; **3,309,760,** Reznick and Nussear, ATTACHING LEADS TO SEMICONDUCTORS; **3,347,771,** Reznick and Noddings, LEAD-TIN ALLOY PLATING FIXTURE FOR SILICON; **3,401,338,** R. W. Bolvin, TESTER FOR SEMICONDUCTOR DEVICES HAVING A ZENER DIODE CONTROLLED BIAS REMOVAL PROTECTION CIRCUIT, **filed** May 18, 1971, D.C.N.J. (Trenton), Doc. 728-71, *Solitron Devices, Inc.* v. *Power Physics Corporation et al.*

3,347,771. (See 3,317,320.)

3,358,088, K. A. Gault, ELECTROMECHANICAL TRANSDUCER, **filed** May 5, 1971, D.C., S.D.N.Y., Doc. 71-C-1991, *CTS Corporation* v. *Becker Electronics Mfg. Corp.*

3,401,306. (See 3,317,320.)

3,401,338. (See 3,317,320.)

3,401,586, G. R. Peterson, Jr., CHORD BAR FOR MULTI-STRINGED INSTRUMENT, **filed** Apr. 30, 1969, D.C., N.D. Tex. (Dallas), Doc. CA 3-3142-C, *Oscar Schmidt International, Inc.* v. *Rhythm Band, Inc.* Consent judgment, patent valid; defendant has infringed and permanently enjoined, June 7, 1971.

3,404,334, C. L. Marshall, COLOR TELEVISION TEST APPARATUS, **filed** Jan. 11, 1971, D.C., S.D. Ind (Indianapolis), Doc. IP71-C-21, *Cecil L. Marshall* v. *Radio Corporation of America.*

3,468,572, F. C. Marino, CONTROLLED AMPLITUDE FREQUENCY SHIFT SIGNAL GENERATOR; 3,472,448, Wolf, Marino, Simon and Kummer, RECORDING SYSTEM FOR BUSINESS MACHINES, filed May 21, 1971, D.C., N.D. Ill. (Chicago), Doc. 71c1249, *Digtronics Corporation* v. *Jewel Companies.*

3,469,916, Billig and Schleeweiss, OVAL SWIMMING POOL, filed June 3, 1971, D.C., E.D.N.Y. (Brooklyn), Doc. 71–C–677, *Bilnor Corporation* v. *Atero Manufacturing Co., Inc.*

3,415,668, Hohbach and Davis, MAKING CHROMATED BLOOD PRODUCTS FOR USE IN ALKALINE BLOOD GLUES OF HIGH VISCOSITY, filed June 3, 1971, D.C. Oreg. (Portland), Doc. C–71–388, *Pacific Adhesives Company, Inc.* v. *The Rath Packing Company.*

3,419,876, Edwards and Winterstein, STREAMLINED ANTENNA AND METHOD OF MAKING THE SAME, filed May 18, 1971, D. C. Conn. (New Haven), Doc. 14410, *Tenatronics, Ltd., Inc.* v. *Yankee Metal Products Corporation.*

3,452,477. (See 2,808,626.)

3,472,488. (See 3,408,572.)

3,478,875, J. H. Roberts, METHOD AND APPARATUS FOR SEPARATING NUT MEATS FROM SHELLS, filed May 18, 1970, D.C., M.D. Ala. (Montgomery), Doc. 3080–N, *James H. Roberts, and Meyer Machine Company, Div. RAMO* v. *Sheldon Martin and Montogmery Pecan Company.* Order of dismissal upon parties' compromisement settlement, Apr. 15, 1971.

3,479,919, J. Lidsky, PRONGED FASTENERS FOR STRUCTURAL MEMBERS, filed Apr. 5, 1971, D.C., S.D. Fla. (Miami), Doc. 71–535–C–TC, *Ronel Corp., etc.* v. *Carroll Sidney Gwyn.*

3,482,324, J. K. Samhat, COMBINED OPTICAL SIGHT AND CENTER PUNCH, filed Nov. 12, 1970, D.C., C.D. Calif. (Los Angeles) Doc. 70–2545–EC, *Jack K. Samhat* v. *Barton Tool & Engineering Co. and David L. Sawyer.* Final judgment, patent is valid, defendant's have infringed and are permanently enjoined, Apr. 23, 1971.

3,482,490, A. V. Thomas, STRIPPER FOR INTERMITTENT SPIRAL TUBE WINDER, filed Dec. 12, 1969, D.C., N.D. Ill. (Chicago), Doc. 69c2575, *Precision Paper Tube Company* v. *Chester Patulski et al.* Voluntary dismissal by plaintiff under Rule 41 (a) (1), Apr. 27, 1971.

3,502,127, Nathanson and Thompson, MEAT CUTTING MACHINE, filed May 20, 1971, D.C. Mass. (Boston), Doc. 71–1041–M, *Doro-Mayo Equipment Company, Inc.* v. *National Packing Machinery Company.*

3,511,464, B. L. Doll, CORNER PAD AND BLANK, filed June 14, 1971, D.C., M.D.N.C. (Greensboro), Doc. C–129–G–71, *Cellu Products Company* v. *Jiffy Manufacturing Co.*

3,521,675, J. A. Dussich, CONTAINER CONSTRUCTION AND USE, filed May 18, 1971, D.C., E.D.N.Y. (Brooklyn), Doc. 71–C–589, *Joseph A. Dussich* v. *Lefrak Organization, Inc.*

3,523,607, Gillemot and Thompson, SERVICE WIRE ENCAPSULATING KIT, filed Apr. 13, 1971, D.C., C.D. Calif. (Los Angeles), Doc. 71–885–DWW, *Communications Technology Corp., George W. Gillemot, John T. Thompson* v. *The Dexter Corp.*

3,523,679, R. A. Clay, AEROSOL ACTUATED JACK, filed Apr. 21, 1971, D.C., C.D. Calif. (Los Angeles), Doc. 71–965–JWC, *Robert A. Clay* v. *The B. F. Goodrich Company.*

3,530,017. (See 2,662,814.)

3,556,883. (See 2,962,764.)

D. 184,739, E. L. Kanter, TOOTHBRUSH AND TOOTHPASTE HOLDER, filed July 28, 1970, D.C., E.D. Va. (Norfolk), Doc. 542–70–N, *Eugene L. Kanter* v. *Colgate-Palmolive Company.* Stipulation, dismissed with prejudice, Apr. 22, 1971.

Certificates of Correction for the Week of Oct. 19, 1971

Re. 27,042	3,558,498	3,573,344	3,577,330
Re. 27,141	3,560,257	3,573,453	3,577,422
D. 220,381	3,560,491	3,573,461	3,577,841
D. 220,533	3,560,734	3,573,813	3,577,997
3,428,994	3,561,436	3,573,910	3,578,032
3,435,120	3,562,422	3,573,931	3,578,301
3,436,276	3,562,633	3,574,055	3,578,793
3,463,730	3,563,110	3,574,183	3,578,888
3,472,038	3,564,107	3,574,316	3,578,956
3,510,448	3,564,120	3,574,360	3,579,184
3,527,665	3,564,314	3,574,622	3,580,138
3,528,834	3,565,495	3,574,627	3,581,011
3,533,817	3,565,841	3,574,841	3,581,125
3,540,977	3,568,704	3,574,986	3,581,142
3,542,874	3,569,603	3,575,215	3,581,486
3,543,089	3,569,743	3,575,422	3,581,610
3,553,172	3,570,243	3,575,934	3,581,990
3,555,513	3,571,778	3,575,959	3,582,377
3,556,455	3,572,035	3,576,489	3,582,654
3,556,694	3,572,153	3,576,643	3,582,797
3,557,154	3,572,698	3,576,983	3,584,090
3,557,405	3,572,700	3,577,266	3,584,536

Dedications

3,545,718.—*Kenneth A. Shale,* Garrettsville, Ohio. REMOVABLE MOLD CORE. Patent dated Dec. 8, 1970. Dedication filed Aug. 18, 1971, by the assignee, *Continental Oil Company.*

Hereby dedicates to the Public the entire remaining term of all claims of said patent.

3,552,863.—*Douglas H. Smith,* San Carlos, Calif. METHOD AND APPARATUS FOR COMPARING THE TRANSMITTANCE OF A SAMPLE AND A STANDARD. Patent dated Jan. 5, 1971. Dedication filed Aug. 23, 1971, by the assignee, *Beckman Instruments, Inc.*

Hereby dedicates to the Public the remaining term of said patent.

3,558,232.—*Victor J. MacCosham,* Menlo Park, Calif. HEATING APPARATUS FOR REACTION KINETICS INVESTIGATIONS. Patent dated Jan. 26, 1971. Dedication filed Aug. 23, 1971, by the assignee, *Beckman Instruments, Inc.*

Hereby dedicates to the Public the remaining term of said patent.

Disclaimers

3,319,127.—*Stanley E. Zocholl,* Philadelphia, Pa., and *James W. Lipnitz,* Cherry Hill, N.J. STATIC OVERCURRENT RELAY. Patent dated May 9, 1967. Disclaimer filed June 7, 1971, by the assignee, *I-T-E Circuit Breaker Company.*

Hereby enters this disclaimer to claims 1, 2, 6 and 7 of said patent.

3,460,362.—*Gilbert Innes Kilgour,* Gartocharn, and *George Edward Ziegler,* Balloch, Alexandria, Scotland. SPIRAL APPARATUS FOR THE FLUID TREATMENT OF FABRICS IN ROPED FORM. Patent dated Aug. 12, 1969. Disclaimer filed June 3, 1971, by the assignee, *United Merchants & Manufacturers, Inc.*

Hereby enters this disclaimer to claims 1, 2, 4 and 13 of said patent.

3,508,911.—*John Y. Riedel,* Bethlehem, Pa. LOW CARBON STEEL WITH TITANIUM ALUMINUM AND BORON. Patent dated Apr. 28, 1970. Disclaimer filed Aug. 24, 1971, by the assignee, *Bethlehem Steel Corporation.*

Hereby disclaims the portion of the term of the patent subsequent to Apr. 20, 1987.

Patents Available for Licensing or Sale

3,477,446. HAIR-TREATING METHOD AND APPARATUS. G. J. Terrenzio et al. Correspondence to: Robert K. Youtie, Suite 2338, P.S.F.S. Bldg., 12 S. 12th St., Philadelphia, Pa., 19107.

3,541,362. ELECTROMAGNETIC GENERATORS. Robert Proulx. Correspondence to: Southwest International, Inc., P.O. Box 374, Albuquerque, N. Mex., 87103.

3,549,441. METHOD OF PRODUCING A HOLLOW ARTICLE HAVING A DECORATIVE APPEARANCE. William J. and Robert H. Mesinger, Durant Ave., Bethel, Conn., 06801.

3,585,992. TRACTION APPARATUS. Elmer L. Vessels, 8021 Stevenson Ave., Sacramento, Calif., 95828.

3,596,077. ROTARY SUPPORT. Matilda M. Miazga. Correspondence to: Sherman Levy, Washington Bldg., 15th St. and New York Ave. NW., Washington, D.C., 20005.

3,598,272. SELF OPENING BOTTLE CAP. Jose A. Bustamante. Correspondence to: Sheldon I. Cohen, Pennsylvania Bldg., Washington, D.C., 20004.

3,598,404. EXERCISING APPARATUS INCLUDING PIVOTALLY CONNECTED WEIGHT SUPPORTING UNITS. George E. Bowman. Correspondence to: Dressler, Goldsmith, Clement & Gordon, 1825 Prudential Plaza, Chicago, Ill., 60601.

The following patent is available for licensing by the Department of Health, Education, and Welfare as provided by Title 45 C.F.R. Section 6.3.

Inquiries should be addressed to: Mr. Norman J. Latker, Chief, Patent Branch, % National Institutes of Health, Room 5A03, Westwood Bldg., Bethesda, Md., 20014.

3,588,512. APPARATUS USING RADIATION SENSITIVE SWITCH FOR SIGNALLING AND RECORDING DATA.

General Electric Company is prepared to grant non-exclusive licenses under the following 76 patents upon reasonable terms to domestic manufacturers.

Applications for license under the following 4 patents may be addressed to: Division Patent Counsel, Space Division, General Electric Co., P.O. Box 8555, Philadelphia, Pa., 19101.

3,549,847. GRAPHITE SUSCEPTOR.

3,585,441. SHOCK IONIZATION GAS ACCELERATOR.

3,591,466. COMPOSITE STRUCTURE PRODUCTION.

3,578,520. THERMAL INSULATION AND BOND FOR SOLID FUEL MOTORS AND METHOD OF MAKING SAME.

Applications for license under the following 13 patents may be addressed to: Patent Counsel, LSGT-I & MT Divisions, General Electric Company, 1 River Road, Bldg. No. 43, Schenectady, N.Y., 12305.

3,099,607. VAPOR RECIRCULATION DISTILLATION PROCESS AND APPARATUS.

3,175,962. FALLING FILM EVAPORATOR.

3,190,817. COMPRESSION DISTILLATION APPARATUS.

3,270,780. COMPOSITE HEAT EXCHANGER TUBE STRUCTURE.

3,293,153. METHOD AND APPARATUS FOR DIFFUSION DISTILLATION.

3,334,023. MULTI-STAGE EVAPORATING APPARATUS.

3,397,730. LIQUID FEED DISTRIBUTOR.

3,452,814. BELL-END CONDENSER TUBES.

3,489,034. EVACUATED GEAR CASING.

3,563,850. ELECTRICAL INSULATION CONTAINING EPOXY RESIN, BIS(2,3-EPOXY-CYCLOPENTYL) ETHER AND RESORCINOL FORMALDEHYDE RESIN.

3,566,010. HEAVY DUTY INSULATING SUPPORT CONNECTOR.

3,577,733. RAPID LOADING OF STEAM TURBINES.

3,579,006. LIQUID COOLED COLLECTOR RINGS FOR DYNAMOELECTRIC MACHINE.

Applications for license under the following 16 patents may be addressed to: Patent Counsel, Major Appliance Business Group, General Electric Company, Appliance Park, Louisville, Ky., 40225.

3,353,368. COMBINATION EVAPORATOR AND RADIANT HEATER DEFROST MEANS.

3,394,559. REFRIGERATOR INCLUDING DEFROST MEANS.

3,436,931. COMBINATION EVAPORATOR AND RADIANT HEATER DEFROST MEANS.

3,457,756. FINNED HEAT EXCHANGER TUBING AND METHOD OF MANUFACTURE THEREOF.

3,532,331. GAS VALVE CONTROL.

3,536,308. IMPROVED CONDITION RESPONSIVE FLUID CONTROL ARRANGEMENT FOR A CLOTHES DRYER.

3,541,814. EXTRACTION SYSTEM FOR WASHING MACHINE.

3,550,405. POSITIVE FILL CONTROL AND WEIGHT DISTRIBUTION SYSTEM FOR AN AUTOMATIC WASHER.

3,556,446. SELF-STABILIZING SUSPENSION SYSTEM.

3,559,426. COVER FOR WASHING MACHINE TUB.

3,570,274. INFINITE SPEED CONTROL FOR AUTOMATIC WASHER.

3,574,254. TOOL FOR INSTALLING FEMALE ELECTRICAL TERMINALS.

3,575,021. DISPENSING CUP HAVING SIDES WHICH UNFOLD UNDER CENTRIFUGAL FORCE.

3,578,016. ANTISIPHON FLUID INLET MEANS.

3,582,697. COMBINATION MOTOR-CLUTCH APPARATUS.

3,585,822. PROPULSION SYSTEM FOR AUTOMATIC WASHER.

Applications for license under the following 46 patents may be addressed to: Patent Counsel, Lamp Division, General Electric Company, Nela Park, Cleveland, Ohio, 44112.

3,290,175. SEMICONDUCTOR PHOTOVOLTAIC DEVICES.

3,300,671. SURFACE-ADJACENT JUNCTION ELECTROLUMINESCENT DEVICE.

3,302,051. SEMICONDUCTIVE ALLOY LIGHT SOURCE HAVING IMPROVED OPTICAL TRANSMISSIVITY.

3,303,432. HIGH POWER SEMICONDUCTOR LASER DEVICE.

3,305,486. SEMICONDUCTOR MATERIAL AND METHOD OF MAKING THE SAME.

3,315,111. FLEXIBLE ELECTROLUMINESCENT DEVICE AND LIGHT TRANSMISSIVE ELECTRICALLY CONDUCTIVE ELECTRODE MATERIAL THEREFOR.

3,320,466. DOUBLE-ENDED ELECTRIC LAMP AND ASSOCIATED U-SHAPED METAL CLIP.

3,330,983. HETEROJUNCTION ELECTROLUMINESCENT DEVICES.

3,333,135. SEMICONDUCTIVE DISPLAY DEVICE.

3,335,311. GLOW DISCHARGE DEVICE HAVING PARALLEL PERMANENT MAGNETIC ROD ELECTRODES.

3,341,916. METHOD OF MANUFACTURING ELECTROLUMINESCENT DISPLAY DEVICES.

3,342,848. N,N′ - DIALKYL - N,N′ - DICYANOALKYL-OPHTHALAMIDES.

3,346,757. ELECTROLUMINESCENT LAMP HAVING AN ALUMINUM ELECTRODE, A LAYER OF DIELECTRIC MATERIAL AND AN ALUMINUM OXIDE LAYER DISPOSED BETWEEN THE ALUMINUM ELECTRODE AND THE DIELECTRIC LAYER.

3,346,758. ELECTROLUMINESCENT LAMP HAVING AN ALUMINUM ELECTRODE WITH AN ALUMINUM OXIDE LAYER DISPOSED BETWEEN THE ALUMINUM ELECTRODE AND THE ELECTROLUMINESCENT MATERIAL.

3,346,761. INCANDESCENT LAMP WITH A TUNGSTEN FILAMENT WITH TANTALUM IMBEDDED IN THE SURFACE TO ACT AS A GETTERING AGENT.

3,364,378. ELECTRIC INCANDESCENT LAMP UNIT BUILT-IN FUSE.

3,379,174. APPARATUS FOR APPLYING A COATING ONTO A LOCALIZED REGION OF THE INSIDE OF A HOLLOW ARTICLE.

3,383,977. METHOD AND APPARATUS FOR INDICATING THE AIM OF PROJECTION-TYPE LAMPS.

3,384,770. ELECTROLUMINESCENT DISPLAY DEVICE HAVING FOLDED ELEMENTS.

3,384,781. SELF-CONTAINED BATTERY-POWERED ELECTRIC INCANDESCENT LAMP.

3,390,311. SELENO-TELLURIDE P-N JUNCTION DEVICE UTILIZING DEEP TRAPPING STATES.

3,409,402. STABILIZATION OF CUBIC SILICON CARBIDE.

3,420,646. LAMP BRIDGE MAKING METHOD AND APPARATUS.

3,430,088. WIRE TERMINAL ELECTROLUMINESCENT DEVICE AND MANUFACTURE.

3,435,270. ELECTROLUMINESCENT DISPLEY DEVICE WITH INDICIA ELECTRODES AND CIRCUIT LEADS OF METAL FOIL.

3,441,771. LIGHT PROJECTION DEVICE AND LIGHT SOURCE SUPPORT MEANS THEREFOR.

3,454,053. COILED FILAMENT FORMING APPARATUS.

3,458,756. INCANDESCENT FLASHER LAMP HAVING A CUTOUT MEMBER CONNECTED IN PARALLEL WITH THE FILAMENT.

3,458,779. SIC P-N JUNCTION ELECTROLUMINESCENT DIODE WITH A DONOR CONCENTRATION DIMINISHING FROM THE JUNCTION TO ONE SURFACE AND AN ACCEPTOR CONCENTRATION INCREASING IN THE SAME REGION.

3,461,522. METHOD OF MANUFACTURING ELECTROLUMINESCENT DISPLAY DEVICES.

3,461,921. MANUFACTURE OF COILED LAMP FILAMENTS.

3,462,209. METHOD OF MAKING VACUUM TYPE ELECTRIC INCANDESCENT LAMPS.

3,462,605. SEMICONDUCTOR LIGHT-EMITTER AND COMBINATION LIGHT - EMITTER - PHOTOCELL WHEREIN THE REFLECTOR OF THE LIGHT EMITTER IS COMPRISED OF A MATERIAL DIFFERENT FROM THAT OF THE LIGHT EMITTER.

3,475,641. ELECTRIC INCANDESCENT LAMP AND MOUNT STRUCTURE WITH LEADING-IN WIRES HAVING INTURNED OFFSET INNER ENDS.

3,484,716. HIGH DUTY CYCLE LASER DEVICE.

3,503,812. ELECTROLUMINESCENT CELL AND METHOD OF MAKING THE SAME.

3,510,717. ELECTRIC GLOW DISCHARGE DEVICE WITH TELESCOPED ELECTRODES.

3,510,732. SOLID STATE LAMP HAVING A LENS WITH RHODAMINE OR FLUORESCENT MATERIAL DISPERSED THEREIN.

3,510,733. SEMICONDUCTIVE CRYSTALS OF SILICON CARBIDE WITH IMPROVED CHROMIUM-CONTAINING ELECTRICAL CONTACTS.

3,514,825. METHOD OF MANUFACTURING ELECTROLUMINESCENT DISPLAY DEVICES.

3,520,740. METHOD OF EPITAXIAL GROWTH OF ALPHA SILICON CARBIDE BY PYROLYTIC DECOMPOSITION OF A MIXTURE OF SILANE, PROPANE AND HYDROGEN AT ATMOSPHERIC PRESSURE.

3,529,200. LIGHT-EMITTING PHOSPHOR-DIODE COMBINATION.

3,534,354. DISCHARGE INDICATOR FOR RECHARGEABLE BATTERIES.

3,541,375. BARRIER LAYER ELECTROLUMINESCENT DEVICES.

3,549,434. LOW RESISTIVITY GROUP IIb–VIb COMPOUNDS AND METHOD OF FORMATION.

3,550,227. LAMP MOUNT MAKING APPARATUS.

PATENT EXAMINING CORPS

R. A. WAHL, Assistant Commissioner
F. H. BRONAUGH, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF OCTOBER 5, 1971

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	6-01-70
GENERAL ORGANIC CHEMISTRY, GROUP 120—I. MARCUS, Director. Heterocyclic; Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	4-20-70
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—L. J. BERCOVITZ, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	8-14-70
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. P. KENT, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	10-07-70
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—W. B. KNIGHT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	5-04-70
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS AND RELATED ELEMENTS, GROUP 210—N. ANSHER, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Miscellaneous.	1-28-71
SECURITY, GROUP 220—R. L. CAMPBELL, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	4-10-70
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	10-02-70
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—W. L. CARLSON, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	9-21-70
PHYSICS, GROUP 280—R. L. EVANS, Director. Photography; Sound and Lighting; Indicators and Optics; Measuring and Testing; Geometrical Instruments.	8-03-70
DESIGNS, GROUP 290—R. L. CAMPBELL, Director. Industrial Arts; Household, Personal and Fine Arts.	10-02-70
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—A. BERLIN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Railways and Railway Equipment; Brakes; Rigid Flexible and Special Receptacles and Packages.	7-13-70
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders Woodworking; Tools; Cutlery; Jacks.	6-03-70
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—A. RUEGG, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	7-06-70
HEAT, POWER AND FLUID ENGINEERING, GROUP 340—C. F. GAREAU, Director. Power Plants; Combustion Engines; Fluid Motors; Pumps; Turbines; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Vaporizing; Temperature and Humidity Regulation; Machine Elements; Power Transmission; Fluid Handling; Lubrication; Joint Packing.	10-02-70
CONSTRUCTIONS, SUPPORTS, TEXTILES, CLEANING, GROUP 350—T. J. HICKEY, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Receptacles; Supports; Cabinet Structures; Centrifugal Separations; Cleaning; Coating; Pressing; Agitating; Foods; Textiles; Apparel and Shoes; Sewing Machines; Winding and Reeling.	8-10-70

Expiration of patents: The patents within the range of numbers indicated below expire during October 1971, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,690,560 to 2,692,986, inclusive
Plant Patents..... Numbers 1,312 to 1,327, inclusive

REISSUES

OCTOBER 19, 1971

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

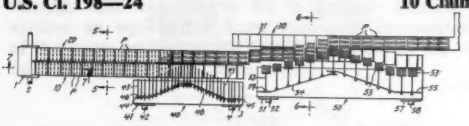
27,190
METHOD AND APPARATUS FOR ORIENTING PAD-LIKE ARTICLES

Louis F. Porcaro, Chicago, Ill., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Original No. 3,409,115, dated Nov. 5, 1968, Ser. No. 634,540, Apr. 28, 1967. Application for reissue Mar. 3, 1969, Ser. No. 807,463

Int. Cl. B65g *47/00*

U.S. Cl. 198—24 10 Claims



A machine and method for unscrambling a continuous stream of pad-like articles and orienting these articles into two columns of spaced rows moving at the same speed by the use of a pair of flanking conveyers which extend parallel to one another. The individual articles in these rows are upstanding and laterally aligned in their smallest dimension due to transverse open receptacles separated by closed receptacles in said conveyers, the conveyers being sufficiently offset so that the rows in each column are in lateral alignment with the spaces between the rows in the other column. The closed receptacles are then opened to form empty receptacles and the spaced rows from one column are moved laterally into the spaces in the remaining column as the conveyers move at constant speed.

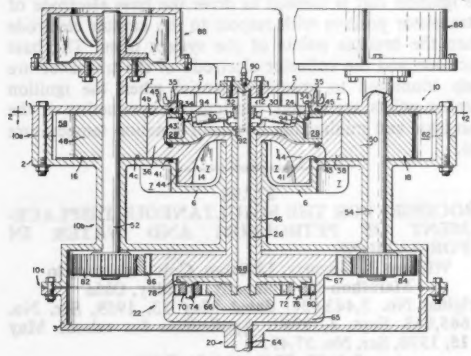
27,191
ROTARY PISTON DEVICE

Frank J. Skrob, deceased, late of Twisp, Wash., by George M. Gibson, executor, assignor to Skrob, Incorporated, Seattle, Wash.

Original No. 3,354,871, dated Nov. 28, 1967, Ser. No. 511,142, Dec. 2, 1965. Application for reissue Nov. 4, 1969, Ser. No. 872,478

Int. Cl. F02b *53/00*

U.S. Cl. 123—8.07 14 Claims



A rotary piston device having a housing with inlet and exhaust ports, central rotary means with a plurality of chambers communicating with an annular chamber, planetary piston means having piston members revolvable around said central rotary means, rotary cut-off means extending into said annular chamber and having recesses for receiving said piston members, a shaft secured to said planetary piston means, and means to rotate said rotary cut-off means.

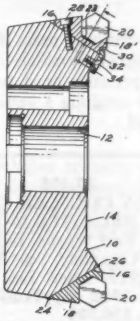
27,192
FINE PITCH MILLING CUTTER IMPROVEMENT

Victor Milewski, Troy, Mich., assignor to The Valeron Corporation

Original No. 3,391,438, dated July 9, 1968, Ser. No. 568,035, July 26, 1966. Application for reissue Nov. 10, 1969, Ser. No. 871,493

Int. Cl. B26d *1/12*

U.S. Cl. 29—105 20 Claims



The present invention relates to a face milling cutter having an annular body with a plurality of closely spaced seating slots which extend through an annular rim portion at an oblique angle wherein the said slots receive seating anvils that are retained by a permanent fixing means and wherein the said anvils seat and locate cutting insert in proper cutting registry.

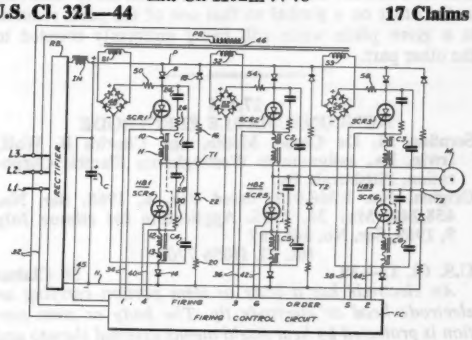
27,193
ELECTRONIC INVERTERS WITH SEPARATE SOURCE FOR PRECHARGING COMMUTATING CAPACITORS

Robert L. Risberg, Milwaukee, Wis., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Original No. 3,355,654, dated Nov. 28, 1968, Ser. No. 381,969, July 13, 1964. Application for reissue Nov. 12, 1969, Ser. No. 871,501

Int. Cl. H02m *7/48*

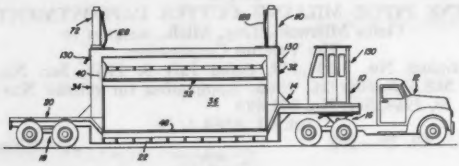
U.S. Cl. 321—44 17 Claims



A three-phase solid state inverter having semi-conductor controlled rectifiers for switching and inductance-

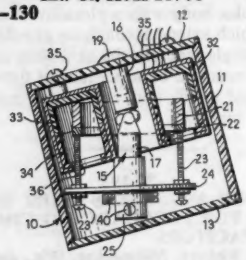
capacitance circuits for commutation of the SCR's including a separate and electrically isolated supply for each phase for precharging the commutating capacitors thereof.

27,194
MOBILE VEHICLE PRESS
Robert L. Flanagan, Dallas, Tex., assignor to WDS, Inc., Oklahoma City, Okla.
Original No. 3,404,622, dated Oct. 8, 1968, Ser. No. 608,621, Jan. 11, 1967. Application for reissue Sept. 30, 1970, Ser. No. 76,746
Int. Cl. B30b *15/00*
U.S. Cl. 100—100 9 Claims



A mobile vehicle crushing press including a horizontal base adapted to support a vehicle to be crushed and a vertically movable pressure head which may be forced toward the base for crushing a vehicle between the base and the pressure head.

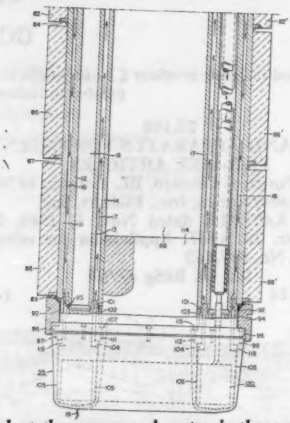
27,195
MAGNETICALLY COUPLED CORE AND COIL HAVING RELATIVE MOVEMENT
Herbert H. Klug, Fort Wayne, Ind., assignor to The Magnavox Company, Fort Wayne, Ind.
Original No. 3,425,015, dated Jan. 28, 1969, Ser. No. 539,475, Apr. 1, 1966. Application for reissue May 19, 1969, Ser. No. 830,900
Int. Cl. H01f *21/06*
U.S. Cl. 336—130 4 Claims



This invention pertains to a magnetic device in which the two magnetic components comprised of a core and inductive coil are mounted so that one can move relatively to the other on a gimbal so that one of the parts remains in a given plane while still being uniformly coupled to the other part.

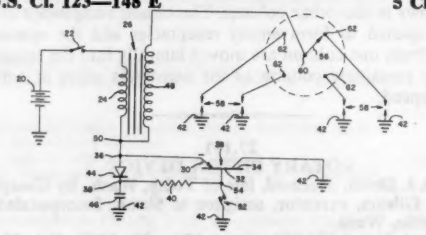
27,196
NONCONSUMABLE ELECTRODE
Serafino M. De Corso, Media, and Charles B. Wolf, Irwin, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.
Original No. 3,368,019, dated Feb. 6, 1968, Ser. No. 458,240, May 24, 1965. Application for reissue July 9, 1969, Ser. No. 846,987
Int. Cl. H05b *7/08*
U.S. Cl. 13—18 30 Claims

An electrode has a body or stem portion carrying an electrode head or electrode tip. The body or stem portion is protected by heat shield means external thereto and includes fluid channeling means for conducting a cooling fluid from the upper end thereof toward the electrode head, the fluid channeling means also conducting the fluid after it has performed its cooling function toward the upper end of the body or stem portion. An axially extending passageway open at the upper end thereof, or which may



be opened at the upper end, extends through the body or stem portion at least to a position near the electrode head.

27,197
IGNITION SYSTEM
James L. Shields, Linton, Ind., assignor to Luvals, Inc., Linton, Ind.
Original No. 3,406,671, dated Oct. 22, 1968, Ser. No. 555,852, June 7, 1966. Application for reissue Feb. 20, 1970, Ser. No. 13,213
Int. Cl. F02p *3/02*
U.S. Cl. 123—148 E 5 Claims

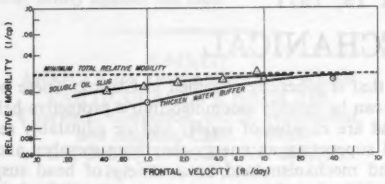


An ignition system for internal combustion engines which provides a hotter spark of shorter duration than that provided by standard ignition systems is disclosed. The self-induced (flyback) voltage of the primary winding of the ignition coil is utilized to drive the base electrode of a transistor positive with respect to the emitter electrode when the breaker points of the system open. The base electrode and the collector electrode of the transistor are both connected to ground potential when the ignition breaker points are closed, causing full conduction of the transistor and minimizing transistor junction temperature rise.

27,198
PROCESSES FOR THE SIMULTANEOUS DISPLACEMENT OF PETROLEUM AND WATER IN FORMATIONS
William B. Gogarty, Littleton, Colo., assignor to Marathon Oil Company, Findlay, Ohio
Original No. 3,443,636, dated May 13, 1969, Ser. No. 665,845, Sept. 6, 1967. Application for reissue May 15, 1970, Ser. No. 37,497
Int. Cl. E21b *43/22, 47/00*
U.S. Cl. 166—252 15 Claims

The present invention comprises a process for the simultaneous displacement of petroleum and water in a formation by injecting thereinto a displacing fluid having a relative mobility [not greater than] *selected in accordance with* the minimum total relative mobility of the oil and water phases reasonably likely to be encountered in

the formation under prevailing formation conditions. The total relative mobility corresponding to the water saturation caused by an appropriate slug of displacement fluid flowing in at least one rock sample reasonably representative of said formation is determined by flowing a repre-



sentative slug of the actual displacement fluid to be used through said rock sample for a distance sufficient to achieve an equilibrium water saturation representative of the water saturation which will be caused by the slug flowing through the actual reservoir.

27,199

PROCESSES FOR THE SIMULTANEOUS DISPLACEMENT OF PETROLEUM AND WATER IN FORMATIONS

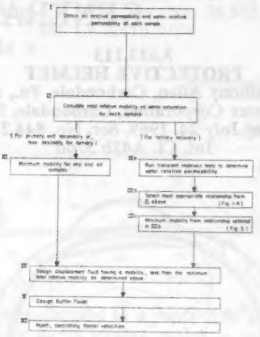
William B. Gogarty, Littleton, Colo., and Harold P. Meabon, Houston, Tex., assignors to Marathon Oil Company, Findlay, Ohio

Original No. 3,443,635, dated May 13, 1969, Ser. No. 665,763, Sept. 6, 1967. Application for reissue May 18, 1970, Ser. No. 48,757

Int. Cl. E21b *43/22, 47/00*

U.S. Cl. 166—252 **32 Claims**

Petroleum and water can be simultaneously displaced in formations by determining the oil relative permeability and the water relative permeability both in relation to water saturation of representative rock samples, then calculating the total relative mobility and determining the minimum total relative mobility reasonably likely to be encountered in the formation. A displacing fluid having a mobility [not greater than] *selected in accordance with*



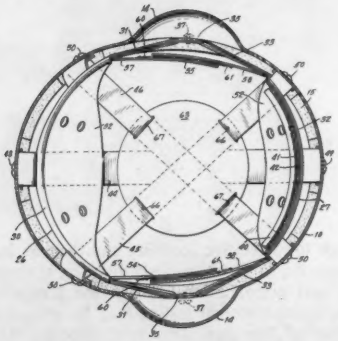
the minimum total relative mobility can then be injected into the formation to simultaneously displace, at controlled rate, water and petroleum present in the formation. In tertiary operations transient testing may be utilized in the determination of the minimum total relative mobility. Petroleum is obviously used for lubricating oils, gasolines, coke, etc.

PATENTS

GRANTED OCTOBER 19, 1971

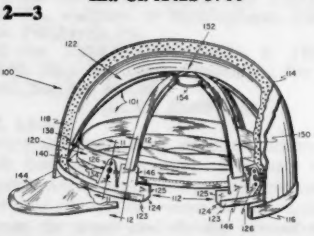
GENERAL AND MECHANICAL

3,613,113
PROTECTIVE HELMET
Jackson Anthony Aileo, Carbondale, Pa., assignor to Gentex Corporation, Carbondale, Pa.
Filed July 24, 1969, Ser. No. 844,273
Int. Cl. A42b *3/00*
U.S. Cl. 2—3 **12 Claims**



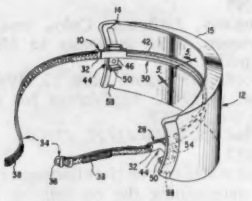
A rigid shell helment having a pair of earcups mounted within the shell and an internal rigging for supporting the shell in spaced relation to a wearer's head. The rigging includes front and rear headbands each anchored at its ends to the shell and of fixed length shorter than the distance between its anchorage points as measured along the shell circumference; one or more pads detachably secured to the rear headband for adjusting the head size of the rigging; and a plurality of headstraps crossing each other above the crown of the head within the helmet. A pair of side headbands respectively extend along opposite sides of the shell interior above the earcups, each side headband being fixedly secured at its opposite ends to the front and rear headbands. The side headbands may each comprise overlapping front and rear pieces, detachably secured together, so as to be adjustable in length. A crown pad is adjustably suspended on the headstraps for cushioning the crown of the wearer's head.

3,613,114
HELMET SUPPORTING AND POSITIONING ASSEMBLIES
Rodney S. Hill, Kenard E. Urion, and Frederick W. Feldmann, Dover, Del., assignors to ILC Industries, Inc., Dover, Del.
Filed Aug. 20, 1969, Ser. No. 851,650
Int. Cl. A42b *3/00*
U.S. Cl. 2—3 **20 Claims**



Support and positioning devices for use in combination with conventional or other components of a protective helmet that is generally classified in Class 2. These novel devices can be quickly assembled into a protective helmet shell and are capable of rigidly and/or adjustably securing and supporting an energy-absorbing member and/or headband mechanism and/or a variety of head suspensions in desired positions within the cavity of the helmet.

3,613,115
DETACHABLE FACE SHIELD SUPPORT FOR A HELMET
Rodney S. Hill, Dover, Del., assignor to ILC Industries, Inc., Dover, Del.
Filed Aug. 20, 1969, Ser. No. 851,623
Int. Cl. A61f *9/04*
U.S. Cl. 2—10 **17 Claims**



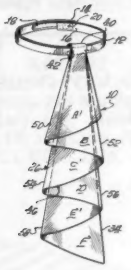
An attachment device for removably securing a retractable face shield assembled therewith, supported on a protective helmet. The device utilizes a band horizontally encircling the helmet near its edge with gripping clips located on opposite sides of the band that engage under edges of the helmet and cooperate with front portions of the band to position and anchor the device securely in place for good operation of the face shield. At the front portion of the band there is a yoke-like bracket which includes a gasketed gripping strip that fits horizontally around the front edge of the helmet with the clips mounted on side ends of the strip to both support slide blocks for carrying the face shield and provide, when the band is tightened, for the front edge of the helmet to be wedged in a sling-like gripping action between the band at the front and the clips at the sides of the helmet.

3,613,116
DRIBBLE TEACHING AID
James G. Stroup, 1501 Pawnee, Enid, Okla. 73701
Filed Apr. 23, 1969, Ser. No. 818,767
Int. Cl. A61f *9/04*
U.S. Cl. 2—12 **7 Claims**

A teaching aid apparatus for basketball dribbling instruction, the apparatus consisting of a horizontal blinding

panel having one edge contoured to fit against a basketball player's face to block downward vision, the apparatus also including brace means for maintaining the blinder panel firmly at a predetermined position relative to the player's nose while a suitable headband holds the blinder apparatus firmly against the face.

3,613,117
ARTICLE OF ORNAMENTAL WEAR PARTICULARLY A NECK TIE
Charles L. Gingerich, 445 N. Westmount, Los Angeles, Calif. 90048
Filed Oct. 13, 1969, Ser. No. 865,618
Int. Cl. A41d *25/02*
U.S. Cl. 2—149 **12 Claims**

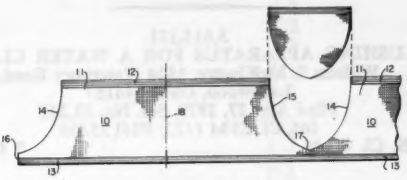


The device is an ornamental article of apparel made from flexible material particularly a cloth fabric. A piece of the material is formed to have two substantially straight edges and preferably one curved edge. Spaced folds are formed in the material extending from spaced positions along the curved edge of the material to spaced positions along one of the straight edges. Alternate folds are opposite to each other. The fold lines form tapered sections of material. These sections are folded, that is superimposed over each other or cascaded to form an article of folded sections depending from a narrow upper end with portions of both sides of the material at the lower ends of the sections being visible.

3,613,118
SLEEP CAP
Raymond J. Lucas, 115 Broad St., Mount Holly, N.J. 08060
Filed Dec. 2, 1968, Ser. No. 780,403
Int. Cl. A42b *1/02*
U.S. Cl. 2—195 **1 Claim**

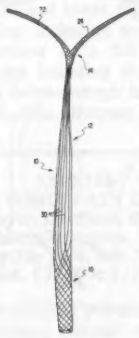
A sleep cap to be worn on the heads of men and women while they are sleeping is composed of a head conforming cap portion to enclose areas of the head which normally grow hair having elastic bands secured thereto for snugly retaining the cap portion on a wearer's head.

3,613,119
ONE-PIECE OR TWO-PIECE PANTY-TYPE GARMENT, AND PROCESS AND FABRIC SUITABLE FOR MAKING SUCH GARMENT
Louis Sarmiento, Hasbrouck Heights, N.J., assignor to International Stretch Products, Inc., New York, N.Y.
Continuation-in-part of applications Ser. No. 10,770, Feb. 12, 1970, and Ser. No. 21,409, Mar. 20, 1970. This application May 12, 1970, Ser. No. 36,552
Int. Cl. A41b *9/04*
U.S. Cl. 2—224 A **4 Claims**



The invention is directed to a panty-type garment (for example, panty or panty girdle), which is constructed in a novel manner, utilizing one or two pieces of fabric. The fabric is of warp knitted construction, and is constructed to have integrally knitted parallel selvedges of one-way stretch, elastic construction. In the finished garment, one of the elastic selvedges forms the waist band, and the other elastic selvedge is cut and sewed to form leg band elastics. A desirable, body-conforming shape is imparted to the garment by utilizing, in the construction thereof, cut sections of the warp knitted material in which the end edges are provided with concave arcuate cuts extending downward and outward from the upper edge. Where large body sizes are to be accommodated, a separate crotch piece is incorporated in the garment construction, extending in the front-to-back direction. The crotch piece, like the main fabric section, is of warp knitted construction and has integral elastic selvedges. In the case of the crotch piece fabric, however, both of the elastic selvedges are the same and correspond to the leg band selvedges of the main or body fabric section.

3,613,120
FLEXOR TENDON PROSTHESIS
Gordon B. McFarland, Jr., New Orleans, La., assignor to Research Corporation, New York, N.Y.
Filed Oct. 21, 1969, Ser. No. 868,076
Int. Cl. A61f *1/00*
U.S. Cl. 3—1 **5 Claims**



Artificial tendons, and particularly a prosthesis for flexor tendons, are provided which comprise end portions which are woven, or of other open mesh configuration to

promote ingrowths of fibrovascular tissue essential for good tendon anchorage and a center portion consisting of multiple parallel filaments which resist infiltration of fibrovascular tissue and promotes free sliding motion of the center part of the prosthesis.

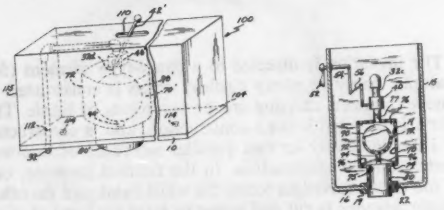
ERRATUM

For Class 3—334 see:
Patent No. 3,613,133

3,613,121
FLUSHING APPARATUS FOR A WATER CLOSET

William S. McKinstry, 1520 Waterbury Road, Lakewood, Ohio 44107

Filed Apr. 27, 1970, Ser. No. 32,235
Int. Cl. E03d *1/22*; F16l *55/00*
U.S. Cl. 4—40 7 Claims

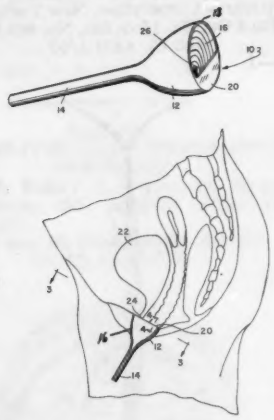


A flushing unit for a water closet comprising a pressurized water supply, a manually operable valve in the supply line, said valve discharging into a silencer chamber that contains a silencer element in the form of a spreader that receives the valve discharge and distributes it uniformly in the chamber from whence the liquid is quietly discharged through a conduit that leads directly into the inlet of the toilet bowl.

3,613,122
FEMININE HYGIENE DEVICE

Anton F. Gross and Phyllis M. Gross, both of 216 Spackenhill Road, Poughkeepsie, N.Y. 12603

Filed June 23, 1970, Ser. No. 49,063
Int. Cl. A61g *9/00*; A61f *5/44*; E03d *13/00*; A47k *11/12*
U.S. Cl. 4—110 6 Claims

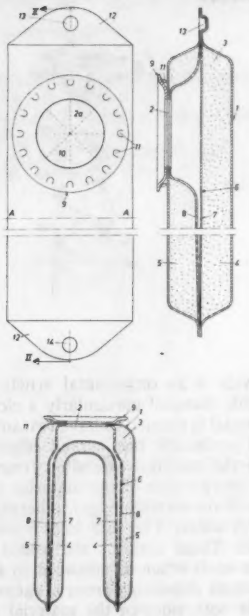


A feminine hygiene device comprising a tapering body portion connecting into an elongated discharge tube, with the body portion including a lip whereby in use urine is directed into the body portion to be discharged through the tube, with the lip being positioned against the body to the rear in order to prevent any backward dripping of urine.

3,613,123
COLLECTING RECEPTACLE FOR LIQUIDS, ESPECIALLY URINE

Hakon Olof Scheibe Langstrom, Goteborg, Sweden, assignor to Peanna, Langstrom & Co., Goteborg, Sweden

Filed Dec. 18, 1969, Ser. No. 886,267
Claims priority, application Sweden, Dec. 31, 1968, 18,045
Int. Cl. E03d *13/00*
U.S. Cl. 4—110 13 Claims



A collecting receptacle for liquids, especially urine is formed as a pliable elongated bag having a single opening in one of its side walls, and comprising a partition dividing the receptacle into two compartments along a major dimension of the bag, the compartments each being filled with absorbent material. The partition is formed by two perforated substantially parallel wall elements of which at least the one nearer said opening includes an aperture substantially aligned with said opening and forming a liquid-tight passage therewith. The wall elements are generally perforated except in the region of said passage and opposite said opening.

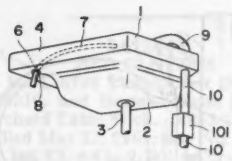
3,613,124
AUTOMATIC WATER-SUPPLY APPARATUS

Masuo Ichimori, Mukomachi, Kyoto Prefecture, and Hideyuki Suzaki, Kyoto, Kyoto Prefecture, Japan, assignors to Omron Tateisi Electronics Co., Ukyo-ku, Kyoto, Japan

Filed Aug. 26, 1969, Ser. No. 853,150
Claims priority, application Japan, Aug. 28, 1968, 43/74,040
Int. Cl. A47k *1/04*
U.S. Cl. 4—166 13 Claims

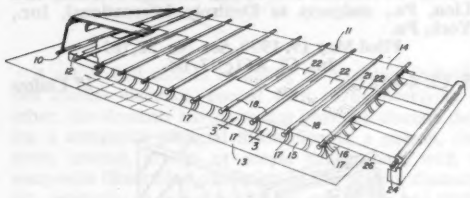
An automatic water-supply apparatus, in which the water-supply to a basin is automatically controlled by the mere proximity to the basin of a human body, operating

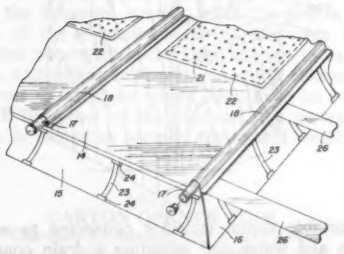
by means of a proximity switch to switch an electromagnetic valve in the event of proximity of a human body to an antenna; the antenna is made of a resilient metal



rod for insertion into a cavity in the brim of the basin through a hole provided in the brim; the cavity is preferably provided in the front brim of the basin, that is, on the side the human thighs approach when using the basin.

3,613,125
SWIMMING POOL COVER
Mile Ivkovich, 190 Montgomery St., Gary, Ind. 46403
Filed Sept. 19, 1969, Ser. No. 859,291
Int. Cl. E04h *3/16, 3/18*
U.S. Cl. 4—172.14 **8 Claims**

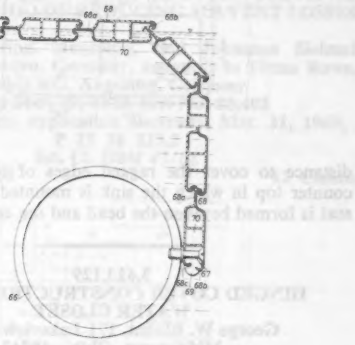




A swimming pool cover comprising a panel having a plurality of lengthwise spaced and transversely extending tubes supporting the panel on the pool coping. A storage means is provided at one end of the pool.

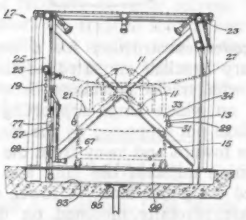
3,613,126
BUOYANT COVER FOR A SWIMMING POOL
Robert Granderath, Am Rodenbach 19, Bergisch Gladbach, Germany
Filed Oct. 22, 1969, Ser. No. 868,296
Int. Cl. E04h *3/16, 3/18*
U.S. Cl. 4—172.14 **19 Claims**

A swimming pool has two opposite sides and is filled to a predetermined level with a body of water. A cover layer arrangement is provided in the form of a cover layer normally rolled in a coil on a shaft extending along and in parallelism with one of the sides of the pool. The cover layer is normally blocked from uncoiling but so arranged that in response to unblocking it can automatically deploy in a sense moving from the one side towards the opposite side of the swimming pool, covering the same and floating in the water near the upper level thereof. Supporting means is provided in the pool below the upper level of the water so spaced from the position which the cover layer assumes in deployed condition that it does



not interfere with movement of the cover layer to the deployed condition but supports the cover layer when a weight is placed upon the same.

3,613,127
APPARATUS FACILITATING CARE OF A BEDFAST PATIENT
James M. Bond, 3435 Ave. H, Fort Worth, Tex. 76105
Filed Nov. 5, 1969, Ser. No. 874,342
Int. Cl. A47k *3/12*
U.S. Cl. 4—185 **25 Claims**

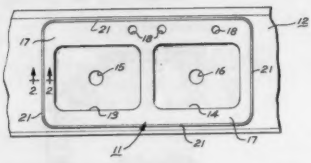


Apparatus facilitating care of a bedfast patient characterized by a bed adapted to support bedding and a patient and to elevate and lower the bedding and patient vertically, the bedding including an upper layer to protrude through apertures in a flat net and support a patient's body without irritating the patient's skin; and a bathing apparatus large enough to encompass the bed and patient. The specific structure and accessories are also disclosed.

3,613,128
SELF-RIMMING PORCELAIN ENAMELED SINK
Harris P. Moyer, Deerfield, Ill., assignor to Unarco Industries, Inc.
Filed May 18, 1970, Ser. No. 38,291
Int. Cl. E03c *1/18*
U.S. Cl. 4—187 **10 Claims**

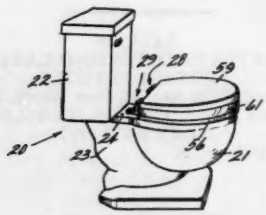
An improved self-rimming porcelain enameled sink including a novel clamping channel used for securing the porcelain enameled sink in a counter top. The clamping channel is mounted on the underside of the sink and cooperates with a lug that engages the underside of the counter top to secure the sink in the counter top. A stainless steel bead is bonded completely around the peripheral

edge of the porcelain enameled sink so that this bead protects the edge during installation and usage and so that the combined edge-bead will extend from the sink a sufficient



distance to cover the ragged edges of the hole in the counter top in which the sink is mounted. A tight water seal is formed between the bead and the counter top.

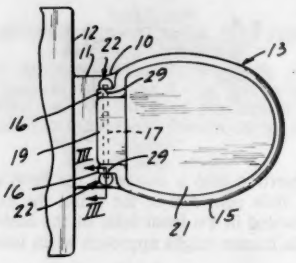
3,613,129
HINGED COVER CONSTRUCTION FOR A WATER CLOSET
George W. Blount, 171 Lakeview Drive, Middletown, Ohio 45042
Filed Dec. 22, 1969, Ser. No. 887,129
Int. Cl. A44k *13/12*
U.S. Cl. 4—236 **6 Claims**



A hinged cover construction for a water closet in which stationary brackets mounted adjacent the bowl are provided with tracks extending between the tank and the bowl on which hinge supporting brackets are mounted. A hinge pin supported by the hinge supporting brackets moves toward and away from the tank between a normal position adjacent the tank and an advanced position spaced from the tank. A lower cover and an upper cover are pivotally mounted on the hinge pin. A resilient cushion is mounted on the lower cover. The covers swings between a lowered position in which the bottom cover is supported on an upper edge of the bowl and the upper cover rests on the cushion and a raised position in which the covers lean against the tank in stable position when the hinge supporting brackets are in advanced position.

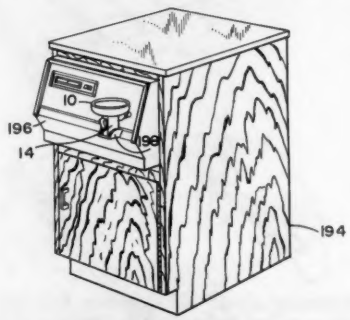
3,613,130
REMOVABLE TOILET SEAT
Fred A. Sansone, 2923 N. 75th Ave., Elmwood Park, Ill. 60635
Continuation-in-part of application Ser. No. 659,488, Aug. 9, 1967. This application May 21, 1969, Ser. No. 826,457
Int. Cl. A47k *13/12*
U.S. Cl. 4—240 **2 Claims**

Fixture for detachably mounting toilet seat on toilet bowl without the use of tools, firmly holding the seat in position and enabling removal of the seat by lifting the seat and the hinge pin for the seat and post parts of the fixture. The fixture includes two socket members extending through the back part of the toilet bowl and secured thereto as by nuts, and posts for the hinge pins, each post having a locking pin depending therefrom within the socket of the socket member and camming the socket member to be locked thereto by pressing each post and pin downwardly along its socket. A detent locking connection is provided between the socket and pin. The posts, pins and



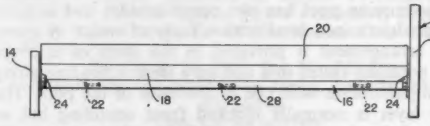
sockets are made from a suitable thermoplastic material having good memory qualities, to assure a snap gripping action of the detent locking connection as the pins are inserted into and withdrawn from the sockets.

3,613,131
DENTAL CUSPIDOR
George H. Stram, York, Ralph J. Williams, New Oxford, George E. Altland, Dover, and Thomas J. Dunn, Red Lion, Pa., assignors to Dentsply International, Inc., York, Pa.
Filed May 19, 1970, Ser. No. 38,769
Int. Cl. A61c *17/04*
U.S. Cl. 4—263 **17 Claims**



A portable dental cuspidor connected to sources of vacuum and water and including a drain control valve and a water control valve, and valve actuating means operable to open the drain control valve to evacuate the cuspidor bowl prior to introducing flushing water to the bowl.

3,613,132
SAFETY BED RAILS
Maurice Weinhart, 18620 Ardmore St., Detroit, Mich. 48235
Filed Feb. 19, 1969, Ser. No. 800,390
Int. Cl. A47c *23/06*
U.S. Cl. 5—238 **12 Claims**



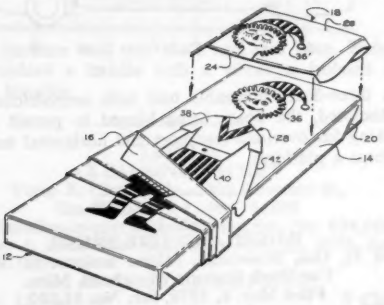
The invention relates to a safety bed rail having lugs provided therein or affixed thereto for securing removable bed slats in fixed spaced-apart relationship, whereby

the bed slats are prevented from shifting off of the side rails, maintain support for the box spring and mattress imposed thereon, and substantially restrain the side rails from bending or bulging outwardly in the medial portion thereof.

3,613,133
BED CLOTHES

Richard A. Isola, 6748 Leslee Crest Drive, Birmingham, Mich. 48010, and Herman Keith Miller, 3720 Erie Drive, Orchard Lake, Mich. 48033

Filed May 21, 1969, Ser. No. 826,370
Int. Cl. A47g *9/00*; A63h *33/00*
U.S. Cl. 3—334 5 Claims

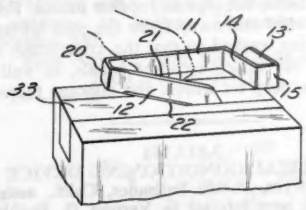


A set of bed clothes including at least two individual bed clothes elements, one at least partly overlying the other; the elements having means provided thereon defining a composite pictorial illustration of a person, character, animal, article, or scenic background, with the composite illustration consisting of the person, character, etc. appearing in one condition on one of the bed clothes elements and appearing in a different condition on the other of the elements, so that when the bed is viewed with one of the elements overlying the other thereof, the depicted person, character, etc. appears to be in one condition, and when the uppermost of the elements is at least in part removed or folded back from its overlying relation to the other of the elements, the person, character, etc. is viewed as being in the second condition.

3,613,134
CARTON OPENER TOOL

Clarence R. Bassett, 255 Steele Ave., Ashland, Ohio 44805

Filed Apr. 23, 1969, Ser. No. 818,643
Int. Cl. B67b *7/30*; B25f *1/00*
U.S. Cl. 7—14.1 21 Claims

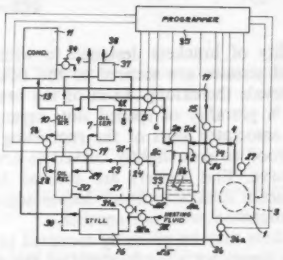


A carton opener tool having a U-shaped handle, an elongated arm extending transversely away from the handle, and an insertion blade connected to the opposite end of the elongated arm and extending back toward the handle and terminating short of the handle in a beveled free end. The insertion blade is angularly inclined to one side so that its free end is offset to that side of the handle and the elongated arm. The free end of the insertion blade is disposed slightly beyond the plane of an end face of the handle in a direction away from the elongated arm.

3,613,135
CLEANING SYSTEM USING VOLATILE SOLVENTS AND METHOD OF REDUCING SOLVENT LOSSES THEREIN

Heinrich Fuhring, Augsburg, and Johannes Helmut Sieber, Aystetten, Germany, assignors to Firma Bowe, Bohler & Weber KG, Augsburg, Germany

Filed Mar. 27, 1970, Ser. No. 23,402
Claims priority, application Germany, Mar. 31, 1969, P 19 16 523.2
Int. Cl. D06f *43/08*
U.S. Cl. 8—158 12 Claims

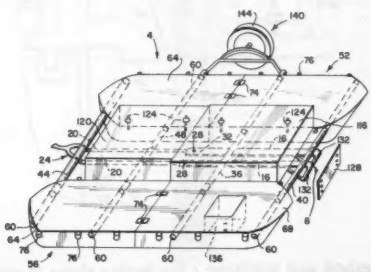


In a dry-cleaning plant a single pump is used to evacuate a freshly loaded treatment drum and, after cleaning operation, the extract solvent vapors from that drum. In the first pumping phase, the air is discharged into the atmosphere by way of a first oil separator which removes entrained lubricant; in the second pumping phase, the vapors pass through a second oil separator into a condenser for the recovery of spent solvent. Thereafter, the two oil separators are emptied into a reservoir whose top is connected with the suction side of the pump for removal of residual solvent via the second oil separator to the condenser; the remaining oil is then returned to the crankcase of the pump.

3,613,136
CATAMARAN

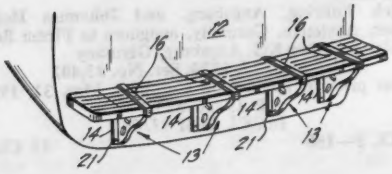
Joseph A. Cogliano, 1268 Maple Ave., Baltimore, Md. 21227

Filed Oct. 3, 1969, Ser. No. 863,572
Int. Cl. B63c *13/00*
U.S. Cl. 9—1 T 12 Claims



A catamaran is disclosed which can be converted into a trailer. The catamaran includes a central support unit which telescopes, two cross members which telescope and which are attached to the central support unit, and two boat units which are formed of two sections, each of which is attached to one of the cross members. One of the boat sections of each boat unit is folded over on the other boat.

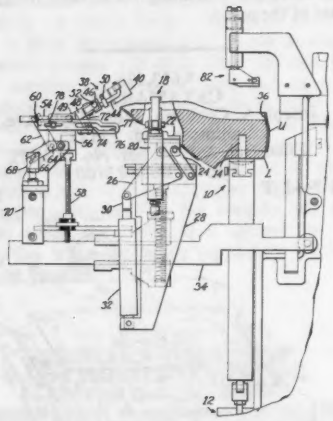
3,613,137
SWIMMING PLATFORM FOR BOATS
William Eccles, Northport, N.Y., assignor to Harvey-Westbury Corporation, Westbury, N.Y.
Filed Mar. 20, 1970, Ser. No. 21,246
Int. Cl. B63c
U.S. Cl. 9—1 R 9 Claims



A plurality of brackets designed to withstand lateral and vertical stresses are secured to the boat transom at spaced intervals therealong. Each of the brackets is provided with a plurality of spaced slots arranged in alignment with associated slots of the remaining brackets for receiving wood strakes slightly curved to conform to the transom curve. End spacers are secured between each pair of adjacent strakes to firmly locate and maintain the strakes in alignment with one another.

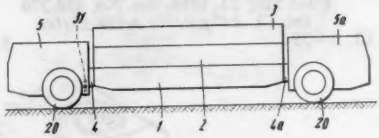
The brackets may be pivotally mounted to the transom by suitable hinges with the free end of the platform portion of each bracket being supported to a lower transom mounted hinge by supporting struts which may be cut to size in order to adjustably level the platform.

3,613,138
METHOD FOR MAKING SHOES
Raymond T. Pelletier, Beverly, and Karl V. Becker, Topsfield, Mass., assignors to USM Corporation, Boston, Mass.
Filed Jan. 14, 1970, Ser. No. 2,720
Int. Cl. A43d 21/00
U.S. Cl. 12—145 4 Claims



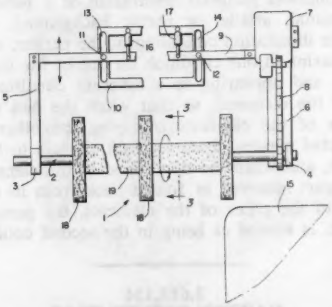
A method and machinery for lasting shoes in which an upper and an insole are assembled on a last with the insole registered on the last bottom at the heel end by the tensioned upper margin and at the toe end by a band. The heel end of the tensioned upper is lasted and secured to the registered insole. The last in subsequent operations is forced into the shaped heel end of the upper to reestablish registration of the insole on the last and the toe end of the upper is lasted and secured to the insole.

3,613,139
SELF-PROPELLED FLOATING STRUCTURE
Klaus Hänsgen, Witten, Fritz Kinzler, Dusseldorf, and Hans Werner Spohr, Willich, Germany, assignors to Firma Mannesmann Aktiengesellschaft, Dusseldorf, Germany
Filed Aug. 7, 1969, Ser. No. 848,319
Claims priority, application Germany, Aug. 14, 1968, P 17 81 060.5; Mar. 14, 1969, P 19 13 967.4
Int. Cl. E01d 15/08
U.S. Cl. 14—27 14 Claims



A three-float collapsible unit with amphibious drives is disclosed, the floats being hinged to permit vertical stacking for overland transport and horizontal unfolding to form a platform.

3,613,140
WHEEL AND TIRE BRUSH
Obed M. Oas, Moorhead, Minn., assignor to Northern Car Wash Systems, Moorhead, Minn.
Filed Mar. 6, 1970, Ser. No. 17,202
Int. Cl. B60s 3/06
U.S. Cl. 15—21 D 8 Claims

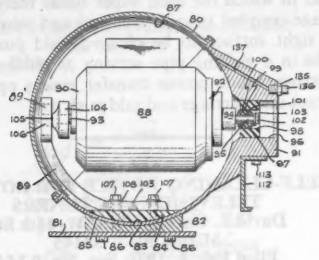


A wheel and tire brush arrangement for automatic vehicle washing devices comprises a horizontal motor driven brush having alternating sections of relatively short, stiff nylon bristles for scrubbing tires and sidewalls and relatively long, soft polypropylene bristles for washing deep set wheels, hubcaps and rocker panels. The brush is movable toward and away from the path traversed by the vehicle being washed so that the same brush may be used to wash the vehicle's rocker panels, as well as the tires, sidewalls, deep set wheels and hubcaps thereof.

3,613,141
MATERIAL CONDITIONING DEVICE
Harold T. Sawyer, Pacific Palisades, Calif., assignor of a fractional part interest to Vernon D. Beehler, Los Angeles, Calif.
Continuation-in-part of applications Ser. No. 631,736, Apr. 18, 1967, and Ser. No. 642,077, May 29, 1967. This application June 11, 1969, Ser. No. 832,156
Int. Cl. A47l 11/12
U.S. Cl. 15—98 5 Claims

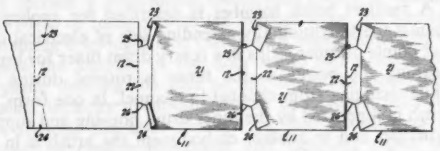
A sonic energy fabric treating apparatus having an eccentrically rotational mass which is resiliently shock mounted at one axial end by one shaft. Another shaft at

the other axial end is connected for transmitting sonic vibration. The shock mounting includes a bore in a boss on a shell surrounding said mass and annular resilient



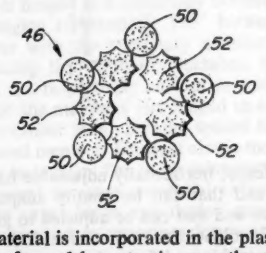
sleeves between said one shaft and said bore. There is also provided a handle with a vibration isolated connection therefor.

3,613,142
CLEANSING PACKET
Verne E. Chaney, Jr., 1000 Chestnut St., San Francisco, Calif. 94109
Continuation-in-part of application Ser. No. 636,065, May 4, 1967. This application Mar. 23, 1970, Ser. No. 21,596
Int. Cl. A47k *7/03;* **B65d** *83/00*
U.S. Cl. 15—104.94 **9 Claims**



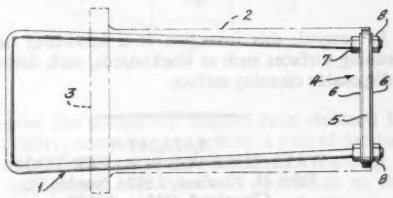
A package constituting a continuous strip of interconnected packets separable from each other along tear lines therebetween and being folded transversely along such tear lines to form an accordion-fold stack positioned within a dispensing container therefor. Each packet comprises an absorbent applicator sheet carrying a liquid or semi-liquid agent to be applied thereby to a body surface, and further comprises an outer overwrap or backing sheet of plastic material attached to the applicator sheet and providing pull tabs adjacent such tear lines.

3,613,143
BRUSH WITH ABRASIVE-IMPREGNATED BRISTLES
Joseph C. Muhler and George K. Stookey, Indianapolis, Ind., assignors to Indiana University Foundation, Bloomington, Ind.
Filed Nov. 12, 1970, Ser. No. 88,625
Int. Cl. A46b *15/00*
U.S. Cl. 15—167 R **18 Claims**



An abrasive material is incorporated in the plastic from which bristles are formed by extrusion or otherwise, and the abrasive-impregnated bristling material is employed in the manufacture of brushes, especially toothbrushes. One preferred brush is formed with bristle tufts, each tuft having in combination relatively small diameter bristles containing a relatively high level of abrasive and having a circular cross section and relatively large diameter bristles containing a relatively low level of abrasive and having a shaped or configured cross section.

3,613,144
JOURNAL BOX CLEANING TOOL
John H. Wetherill, Columbus, Ohio, assignor to Hennessy Products, Incorporated, Chambersburg, Pa.
Filed Nov. 17, 1969, Ser. No. 877,301
Int. Cl. B61f *17/28*
U.S. Cl. 15—210 **4 Claims**



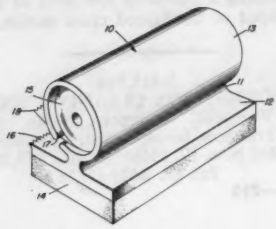
A cleaning tool for insertion into a railway axle journal box and beneath a journal and bearing therein for removing waste, dirt and sediment in the lower portion of the box. The tool comprises an elongated handle with a transverse blade at one end adapted to be inserted under the journal, and adapted to be manipulated freely from the outside of the box.

Preferably, the handle is of a U-shaped adapted to straddle the journal endwise, and the blade is a felt strip with a stiffening plate of less length and width than the felt strip.

3,613,145
POLISHING RING
Rudolf Kneusels, Wuppertal-Vohwinkel, Germany, assignor to Bi-Flex Birkenstock KG, Wuppertal-Vohwinkel, Germany
Filed Mar. 14, 1969, Ser. No. 807,382
Claims priority, application Germany, Mar. 16, 1968, P 16 77 144.1
Int. Cl. B24d *13/04*
U.S. Cl. 15—230.15 **5 Claims**

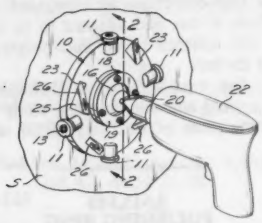
A polishing ring with individual textile strips constituting a polishing border, which comprises a carrying ring, and a plurality of textile-strips surrounding the carrying ring in about U-shape. The textile-strips have multi-layer legs, and means are provided for connecting together the multi-layer legs outside of the carrying ring. Each of the U-legs forms foldings by multiple twisting of the textile-strips.

3,613,146
BLACKBOARD ERASER
Edwin N. Oviatt, Crotty Ave., P.O. Box 327, Brookfield, Mass. 01506
Filed Feb. 4, 1969, Ser. No. 796,521
Int. Cl. B43l *21/04*
U.S. Cl. 15—231 **1 Claim**



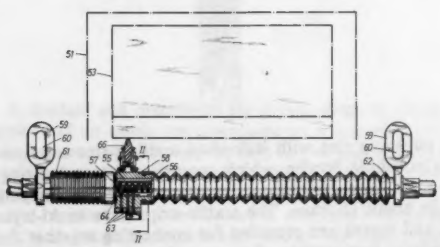
In general, this invention is a hand-held device for cleaning surfaces such as blackboards, such device having a disposable cleaning surface.

3,613,147
WALL SURFACE SCRAPER TOOL
John H. Norfleet, 15006 Naples St., Cleveland, Ohio 44128
Filed May 26, 1969, Ser. No. 827,850
Int. Cl. A47l *1/06*
U.S. Cl. 15—236 **7 Claims**



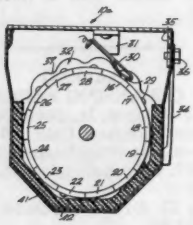
Wall surface scraper tool having rollers to engage the surface to be scraped and one or more adjustable blades supported to extend at an acute angle to that surface. The tool is power driven by an electric drill and has a plurality of inclined blades and rollers around its periphery.

3,613,148
WINDSHIELD WIPER ARRANGEMENT
Willi Meissner and Horst Wieltsch, Heiligenhaus, Germany, assignors to Teleflex Gesellschaft mit beschrankter Haftung, Heiligenhaus, Germany
Filed June 17, 1970, Ser. No. 46,868
Claims priority, application Germany, June 20, 1969, P 19 31 384.9
Int. Cl. B60s *1/44*
U.S. Cl. 15—250.29 **10 Claims**



A wiper assembly, especially for maintaining clean a plurality of sight surfaces forming an angle with each other, which includes a plurality of wiper blades actuated by a single drive, in which the power transfer from a drive to the wiper blades is effected by means of a push rod, and in which for each wiper blade there is provided a carriage coupled to said push rod and movable parallel to the sight surface to be cleaned, said push rod being movable in a guiding pipe serving as guiding means for said carriage while power transfer means operatively interconnect said carriage and said push rod.

3,613,149
SELF-CLEANING DEVICE FOR ROTARY TELEVISION SET TUNERS
David E. Gurkin, 3165 SW. 18th St., Miami, Fla. 33145
Filed Feb. 6, 1970, Ser. No. 9,154
Int. Cl. H03j *3/00*
U.S. Cl. 15—256.51 **2 Claims**

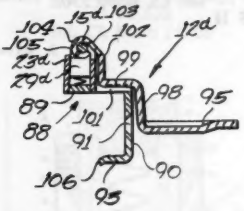


A resilient brush member is described for application against the longitudinally-extending sets of electrical contact points of tuner strips in a rotary drum tuner for brush-cleaning the points as the tuner is rotated during use while changing from channel to channel. In one form, the brush is supported by the tuner drum housing and support structure, and in another embodiment the brush is in the form of a layer of resilient brush material fixed against the inside of the tuner assembly cover and adapted to press against the contact points when the cover is fitted in place on the housing and support structure.

3,613,150
HINGE
Norman W. Osborn, 2199 East 2875 South, Salt Lake City, Utah 84109
Filed July 2, 1970, Ser. No. 51,984
Int. Cl. E05d *7/04*
U.S. Cl. 16—134 **11 Claims**

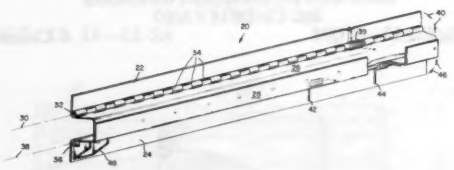
A vertically, horizontally adjustable hinge that is easily installed and that can be readily adapted to any hardware decor and that can be adjusted to give free swinging and equal weight distribution of a door with which it is used even within a deformed or wracked frame.

3,613,151
HINGE CONSTRUCTION
Ralph F. Anderson and Richard C. Henson, Rockford, Ill., assignors to Keystone Consolidated Industries, Inc., Peoria, Ill.
Filed June 27, 1969, Ser. No. 837,130
Int. Cl. E05d 1/12
U.S. Cl. 16—180 4 Claims



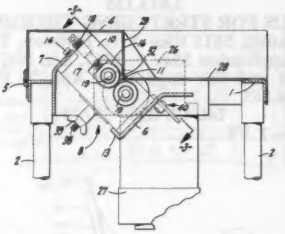
Hinge constructions for the doors of cabinets or other enclosures where the door is mounted to swing between open and closed positions, with the hinge having a door wing and a cabinet wing. The door wing is of a configuration for either an inset or an overlay type of door, and the cabinet wing is either exposed or partially concealed. One type of cabinet wing includes a generally U-shaped flange that fits around and clamps onto the edge of the cabinet frame with only a single screw required to secure the wing to the frame. The cabinet and door wings may include a self-closing mechanism having a housing secured to or integral with the cabinet wing, the housing containing a spring-biased cam that is urged outwardly to engage the knuckle of the door wing, and a hinge pin or pintle defining the axis of the door. The door wing knuckle includes a cut-out portion cooperating with the cam to urge the door through the last few degrees of the arc of closing movement and yieldably retain the door closed.

3,613,152
SELF-CLOSING 180° OPENING, CONCEALED HINGE
Joseph L. Spurlin, Oceanside, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.
Filed Nov. 21, 1968, Ser. No. 777,792
Int. Cl. E05f 1/12
U.S. Cl. 16—189 11 Claims



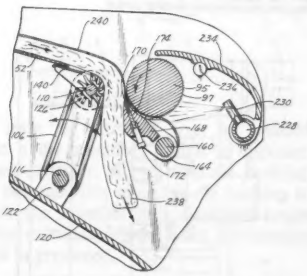
A cabinet hinge system wherein a swingable cabinet closure member is hinged to a stationary cabinet member for outward swinging substantially 180° between closed position uniplanar with the stationary member to fully open position facing the stationary member. Individual flat hinge leaves are respectively surface mounted to the interior surface of the members and hinged to a common linking channel member along parallel spaced hinge axes flanking the channel member. Unequal elastic means, such as helical springs or resilient flex hinge joints, acting along each hinge axis coact to cause sequential swinging about one and then the other hinge axis during movement of the closure member and to urge the closure member to closed position.

3,613,153
TENDON PULLING MACHINE
Emery L. McDonald, Cupertino, Calif., assignor of a fractional part interest to Anthony J. Volk, Turlock, Calif.
Filed Feb. 2, 1970, Ser. No. 7,951
Int. Cl. A22c 21/00
U.S. Cl. 17—11.3 7 Claims



A machine, for pulling the tendons from deboned leg meat of poultry, comprising essentially a pair of toothed, parallel rolls—in the nature of pinch rolls—running in meshing engagement and driven in opposition so that such rolls turn on one side toward the line of engagement, or pinch line, thereof; there being a guard plate overlying such one side of the rolls, and the guard plate having a row of relatively short slots therethrough closely adjacent and parallel to said pinch line. The deboned leg meat, in the form of a substantially flat piece, is pressed against the guard plate in a position such that end portions of the tendons project through the slots and to the pinch line of the rolls, whereupon the latter grasp such tendons and forcefully pull them out of the leg meat; the latter being restrained or held back from the rolls by the guard plate.

3,613,154
FISH SKINNING DEVICE
Ray T. Townsend, Des Moines, Iowa, assignor to Townsend Engineering Company, Des Moines, Iowa
Filed Oct. 15, 1969, Ser. No. 866,530
Int. Cl. A22c 25/17
U.S. Cl. 17—62 16 Claims



A fish skinning device comprising, a feed tray means mounted on a support means and adapted to support the fish to be skinned thereon. A cutting blade means is pivotally supported on the support means and is pivotal away from and towards a rotatable feed roller positioned thereabove. A pressure roller means is rotatably and pivotally mounted on the support means between the feed roller and the feed tray and is adapted to engage the under side of the fish being skinned to yieldably urge the same into engagement with the cutting blade and feed

roller. Linkage means interconnects the cutting blade and the pressure roller to permit the cutting blade to be pivoted away from the feed roller and to permit the pressure roller to be pivoted away from the cutting blade and the feed roller. Means is also provided to permit the pressure roller to pivot away from the feed roller without causing the pivotal movement of the cutting blade.

3,613,155

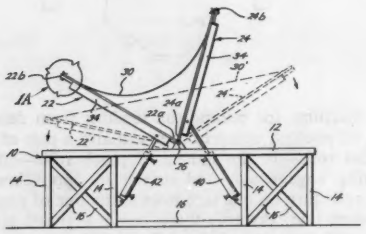
APPARATUS FOR STRETCHING THERMOPLASTIC

Dan E. Bloxsom, 5615 Rice Ave., Houston, Tex. 77036

Original application May 8, 1967, Ser. No. 636,850. Divided and this application Apr. 7, 1969, Ser. No. 856,865

Int. Cl. B29c *17/02*

U.S. Cl. 18—1 FS **4 Claims**



A method and apparatus for stretching a sheet of thermoplastic material to increase substantially the surface area thereof while simultaneously increasing strength of the material. In one embodiment, opposed ends of the sheet are supported and moved through an arcuate path in opposite directions until the ends are in a substantially horizontal coplanar relation. In another embodiment, opposed ends of the sheet are supported and rotated axially in opposite directions and then forced apart in opposite directions in coplanar relationship.

3,613,156

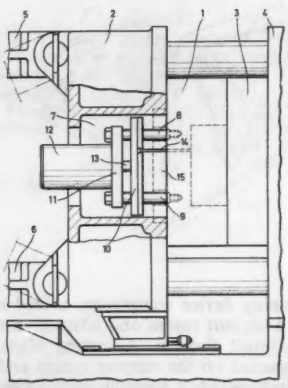
PRESSURE CASTING MACHINE

Heinz Jäger, Braunschweig, Germany, assignor to Volkswagenwerk Akt., Wolfsburg, Germany

Filed Sept. 23, 1969, Ser. No. 860,273

Int. Cl. B29f *1/14*

U.S. Cl. 18—2 RM **1 Claim**



Pressure casting machine having a movable frame and an ejector plate with ejectors guided along columns together with a hydraulic shifting arrangement as a hydraulic cylinder for the ejector plate.

3,613,157

PRESSURE CHAMBER FOR TREATING MATERIAL WITH HIGH PRESSURE, SUCH AS ISOSTATIC COMPRESSION OF POWDER BODIES

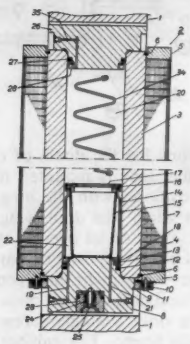
Torstein Landa, Perti Syvakari, and Erik Westman, Vasteras, Sweden, assignors to Allmänna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Mar. 10, 1969, Ser. No. 805,756

Claims priority, application Sweden, Mar. 11, 1968, 3,163/68

Int. Cl. B30b *5/02*

U.S. Cl. 18—5 H **6 Claims**



A pressure chamber for the isostatic compression of powder bodies includes a high pressure cylinder with end closures projecting into the cylinder. There are two arrangements for supplying pressure media. One of the end closures is a unit surrounded by the pressure medium which operates on the workpiece, this unit projecting into the cylinder and having a displaceable wall which separates the two pressure media.

3,613,158

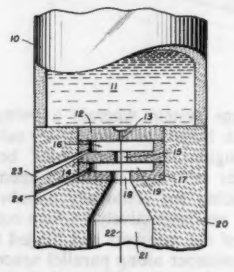
ORIFICE ASSEMBLY FOR SPINNING LOW VISCOSITY MELTS

John W. Mottern, Cary, Robert E. Cunningham, Raleigh, and Robert P. Bell, Cary, N.C., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 15, 1969, Ser. No. 884,859

Int. Cl. D01d *11/00*

U.S. Cl. 18—8 QM **4 Claims**



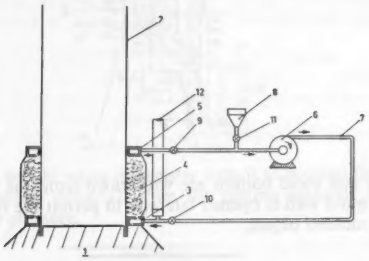
An improved orifice assembly and process is provided whereby fine diameter and/or light fibers and filaments may be formed from essentially inviscid melts without attending sinuous effects upon the extruded molten stream.

3,613,159

APPARATUS FOR COATING EXTRUDED PLASTIC TUBES WITH FINELY DIVIDED SILICA OR SILICATES

Hanns Biegler, Wesseling, Germany, assignor to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, Germany

Original application July 2, 1968, Ser. No. 741,942. Divided and this application Feb. 3, 1970, Ser. No. 8,186
Claims priority, application Germany, July 5, 1967, D 53,530
Int. Cl. B05b *13/00*
U.S. Cl. 18—14 A 4 Claims



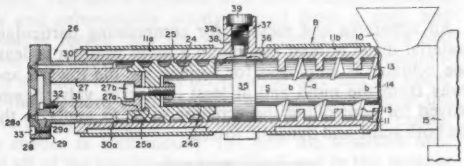
Extruded plastic tubes are coated with finely divided silica or silicates by contacting such tubes shortly after extrusion while they are still warm and soft with a turbulent suspension of the finely divided silica or silicates in air which have assumed a negative electrostatic charge whereby the silica or silicates are deposited as a thin coating on the oppositely charged extruded tube. The apparatus for such coating process comprises an extruder, an annular chamber adapted to surround the extruded tubes, means for introducing finely divided silica or silicates turbulently suspended in air into such chamber to contact and coat such extruded tubes and means for withdrawing excess suspended silica or silicates from such chamber and recycling it back to the chamber.

3,613,160

VARIABLE BYPASS ORIFICE FOR CONTINUOUS MIXER

Bernard A. Loomans and David B. Todd, Saginaw, Mich., assignors to Baker Perkins Inc., Saginaw, Mich.

Filed Nov. 24, 1969, Ser. No. 879,446
Int. Cl. B29f *3/02*
U.S. Cl. 18—12 SA 3 Claims



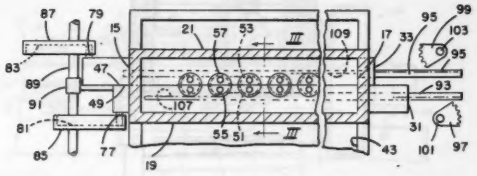
A mixer, including a barrel having a passage therethrough in which is accommodated a reciprocating and rotating mixer shaft. An annular ring or plug mounted on the shaft closes the passage to the flow of material therethrough and a bypass orifice of variable size connects the passage portions on opposite sides of the ring. Externally adjustable means is operable during operation of the mixer shaft to vary the size of the orifice and control the flow of material therethrough and the holdback of material therein.

3,613,161

APPARATUS FOR CONTINUOUSLY EXTRUDING NET-LIKE STRUCTURES COMPOSED OF TWISTED MULTIFILAMENT YARNS

Theodore H. Fairbanks, West Chester, Pa., assignor to FMC Corporation, Philadelphia, Pa.

Filed May 16, 1969, Ser. No. 825,213
Int. Cl. B29f *3/06*
U.S. Cl. 18—12 N 5 Claims



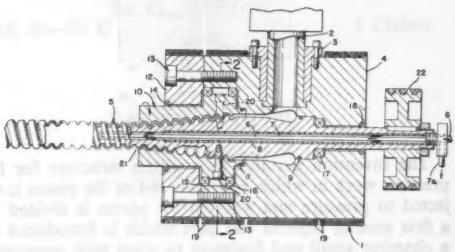
Apparatus for making net-like structures in which extruded groups of streams of strand-forming material are set into groups of filaments, with the individual groups of filaments being twisted into yarns and interlaced and/or twisted with each other concomitantly with their formation.

3,613,162

APPARATUS FOR THE FORMATION OF HELICAL PLASTIC PIPE

Herbert Talsma, East Cleveland, Ohio, assignor to The Standard Oil Company, Cleveland, Ohio

Filed Mar. 10, 1970, Ser. No. 18,213
Int. Cl. B29d *23/04*
U.S. Cl. 18—14 RR 3 Claims



Plastic resin is extruded over a rotatable cooling mandrel in a die assembly which is disposed upon the barrel of an extruder. A rotatable die bushing embraces the end of the mandrel; when the die bushing is rotated in unison with the mandrel in a direction counter to that imparted the extrudate by the helix, an extrudate with no net rotation is produced.

3,613,163

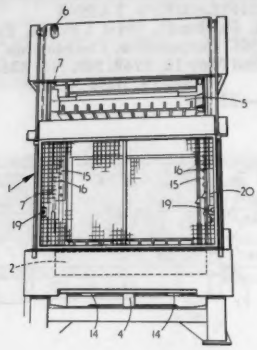
PRESSES

Cyril Kennerley, Middlewich, England, assignor to E.R.F. Engineering Limited, Biddulph Moor, Stoke-on-Trent, England

Filed Mar. 20, 1969, Ser. No. 808,951
Claims priority, application Great Britain, Mar. 22, 1968, 13,937/68
Int. Cl. B30b *1/34*
U.S. Cl. 18—16 R 8 Claims

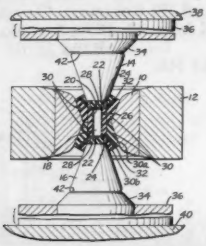
A press comprising a table mounting a lower platen, an upper platen connected with the table via chains and

pulleys, a ram for moving the table between a loading position and a position in which a pressing operation can



be effected, and at least one ram for moving the lower platen relative to the table to effect a pressing operation.

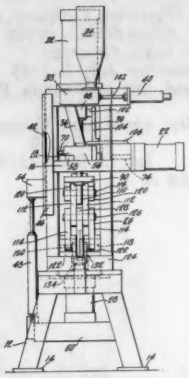
3,613,164
PISTON CONSTRUCTION FOR HIGH PRESSURE APPARATUS
Bela J. Nemeth and Benjamin Clark Boeckeler, Greensburg, Pa., assignors to Kennametal Inc., Latrobe, Pa.
Filed Aug. 7, 1968, Ser. No. 750,809
Int. Cl. B30b *11/32*
U.S. Cl. 18—16.5 **5 Claims**



The invention pertains to a piston structure for high pressure work in which a smaller end of the piston is subjected to pressure and wherein the piston is divided into a first smaller tapered end part which is introduced into a chamber small end foremost to exert high pressure on a sample in the chamber, and into a second larger part separate from the smaller end part and which larger part delivers the thrust from a press to the larger end of the smaller end part so that if piston breakage occurs it will be confined to the smaller end part.

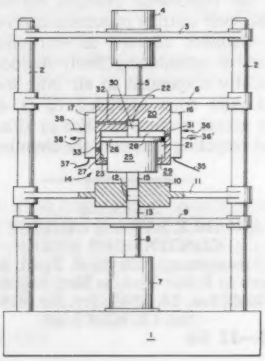
3,613,165
PRESS FOR FORMATION OF MOLDED OBJECTS
Dwight O. Corey, Memphis, Tenn., assignor to Ambac Industries, Incorporated
Filed Jan. 21, 1969, Ser. No. 792,556
Int. Cl. B30b *11/00*
U.S. Cl. 18—16.5 **24 Claims**

This press forms a molded object in a mold which is open at at least one end to receive flowable moldable material which has a lateral wall which is movable in order to permit lateral removal from the mold of a molded object. A tube is first inserted laterally into the mold and the mold is closed. A mold bottom is moved upwardly into the bottom of the mold and closes the bottom of the mold. Flowable moldable material is allowed to enter the open upper end of the mold by gravity flow, after which a ram is driven down into the upper end of the mold and into the moldable material to compress and mold that material into a molded object. Thereafter the



ram and mold bottom are withdrawn from the mold and the mold wall is opened laterally to permit the removal of the molded object.

3,613,166
COMPACTION OF PARTICULATE MATTER
Richard W. Wallace, Pittsburgh, and Stanley R. Pavlica, Irwin, Pa., assignors to Dresser Industries, Inc., Dallas, Tex.
Filed June 26, 1969, Ser. No. 836,810
Int. Cl. A22b *5/08*
U.S. Cl. 18—16.5 **3 Claims**

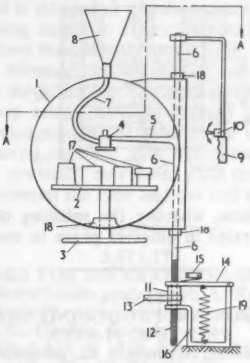


An apparatus and method for compressing particulate material using at least one die in a mold wherein at least one actuator is employed for forcing the die toward and away from the mold and at least one servo valve is employed for controlling the actuator so as to apply to the die both static and dynamic forces.

3,613,167
CASTING APPARATUS
Alexander Young Stirrat, Fairlawn, Broadstone, Dorset, England
Filed July 23, 1969, Ser. No. 844,049
Claims priority, application Great Britain, July 26, 1968, 35,879/68
Int. Cl. B29c *5/00*
U.S. Cl. 18—26 R **7 Claims**

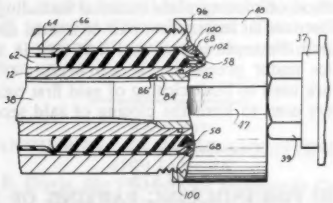
Casting apparatus having a vacuum chamber in which moulds to be filled are supported. A flexible supply duct feeds the material to be cast to the moulds through a nozzle and is positionable from outside the chamber to

sequentially bring the nozzle into register with the moulds while the chamber is evacuated. The nozzle can be urged



against each mould while in register with it to prevent the escape of casting material when the casting material is placed under pressure.

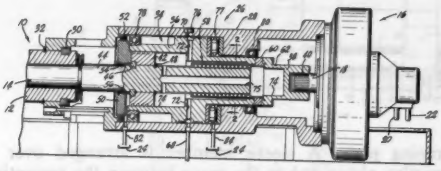
3,613,168
APPARATUS FOR MANUFACTURE OF CORED RUBBER ROLLS HAVING A SLEEVE THEREON
Le Roy R. Rowland, % Mrs. Gertrude Rowland, 2014 Frampton St., Charleston, S.C. 29407, and Charles L. Tavelle, 107 Temple Ave., North Charleston, S.C. 29406
Filed July 2, 1969, Ser. No. 9,242
(Filed under Rule 47(a) and 35 U.S.C. 116)
Int. Cl. B29f *1/00*
U.S. Cl. 18—30 UM **10 Claims**



A method and an apparatus for producing a cored rubber roll having a thin flexible sleeve placed thereon. The method is characterized by the simultaneous formation of the rubber roll and the placement of the sleeve thereon. The sleeve is placed in a mold casing concentric with and substantially evenly spaced from a core, and rubber is forced into the space between the core and sleeve. The rubber is under pressure while it is continuously supplied to the area between the core and the sleeve and the pressure of the rubber on the sleeve causes the sleeve to expand against the inside surface of the casing. The rubber is continuously fed into the available area until all of the spacing has been filled, and in this manner the sleeve is integrally bonded to the rubber while the rubber is simultaneously integrally bonded to the core.

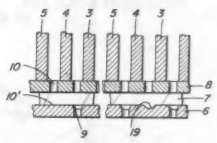
3,613,169
DRIVE ASSEMBLY FOR A RECIPROCATING SCREW EXTRUDER
William E. Ziegler, Ann Arbor, Mich., assignor to Hoover Ball and Bearing Company, Saline, Mich.
Filed May 5, 1970, Ser. No. 34,692
Int. Cl. B29f *1/02*
U.S. Cl. 18—30 SS **8 Claims**

Extruder apparatus for plasticizing and extruding organic plastic material which includes a drive assembly for reciprocating and continuously rotating the screw of the extruder. A hydraulic motor is provided for turning the screw at the speed of the motor. Mounted between the screw and the motor is a shot or hydraulic cylinder which is connected at the cylinder end to the rotary output shaft of the motor and at the piston rod end to the screw of the extruder. The piston and its rod are coupled for co-



rotation with the cylinder by a ball spline assembly which allows free axial movement between the piston and the cylinder. The ball spline assembly is located within the pressure chamber of the cylinder so that it is lubricated by the hydraulic fluid supplied for actuating the hydraulic cylinder. The hydraulic fluid for the cylinder can be supplied from the same source that is available for operating the hydraulic motor.

3,613,170
SPINNING APPARATUS FOR SHEATH-CORE BICOMPONENT FIBERS
Keiichi Soda and Masayuki Ueki, Okayama, Japan, assignors to American Cyanamid Company, Stamford, Conn.
Filed Apr. 28, 1970, Ser. No. 32,650
Claims priority, application Japan, May 27, 1969, 44/49,761
Int. Cl. D01d *3/00*
U.S. Cl. 18—85 C **5 Claims**

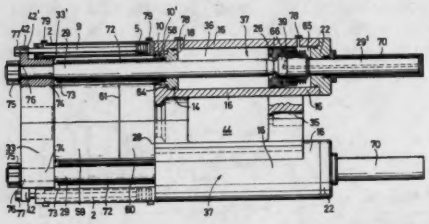


An apparatus for spinning a large number of sheath-core type bicomponent fibers from a single spinnerette is disclosed which comprises a spin dope distribution assembly, immediately adjacent the outlet surface of said assembly an orifice plate, and spaced therefrom, a spinnerette plate arranged in a manner wherein a first spin dope upon emerging from said orifice plate emerges through aligned orifices in said spinnerette plate and a second spin dope upon emerging from said orifice plate travels laterally in the spacing provided and emerges as a sheath around said first spin dope.

3,613,171
CLAMPING UNIT FOR MOLDING MACHINES
Karl Hehl, 183 Siedlung, 7291 Lossburg, Wurttemburg, Germany
Filed July 29, 1970, Ser. No. 59,135
Claims priority, application Germany, July 30, 1969, G 69 30 136.6
Int. Cl. B29f *1/06*
U.S. Cl. 18—30 LV **11 Claims**

A clamping unit for a mold designed for processing synthetic material has a cylinder block defining a plurality of cylinders. Each cylinder has a piston rod arranged

therein to form a fluid drive means for clamping a movable and a fixed mold part together. The movable mold part is attached to the piston rods by means of a movable



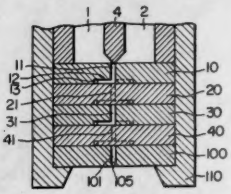
clamping plate. A sleeve member is arranged over a respective piston rod in the space between the respective cylinder and the movable clamping plate, and is attached to the end face of the respective cylinder.

3,613,172
FORM FOR ELASTIC GLOVES
Harry Joseph Giambrone, Kettering, Ohio, assignor to Baxter Laboratories, Inc., Morton Grove, Ill.
Filed Oct. 22, 1969, Ser. No. 868,331
Int. Cl. B29c *13/00*; B29h *3/04*
U.S. Cl. 18—41 **9 Claims**

A form for making elastic, form-fitting surgical gloves and the like in which the center of the first joint of the thumb portion is transversely located forward of the palm of the hand shaped form, and is laterally located at one side of the finger portions, and in which the thumb portion bends at a transverse angle away from the palm and at a lateral angle toward the side of the thumb on which the finger portions are located.

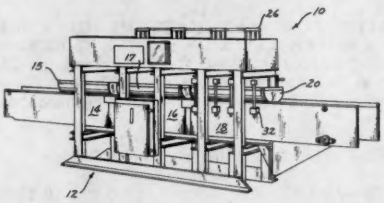
3,613,173
MIX-SPINNING APPARATUS
Masao Matsui, Takatsuki, and Masahiro Yamabe, Neyagawa, Japan, assignors to Kanegafuchi Boseki Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 13, 1968, Ser. No. 783,508
Claims priority, application Japan, Dec. 20, 1967, 42/82,022; Feb. 27, 1968, 43/12,426
Int. Cl. D01d *5/28*
U.S. Cl. 18—8 SC **20 Claims**

A spinning apparatus capable of manufacturing a multi-layer filament from at least two-spinning materials by using a layer-multiplying mixer consisting of a three-dimensional passage network which include at least two network elements arranged in successive stages, the network element being composed of repeated unit passages ar-



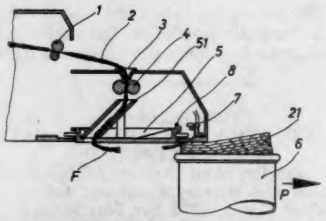
ranged on a plane, whereby the spinning materials are joined and separated in different phase in multi-stages.

3,613,174
APPARATUS FOR PRODUCING MOLDED PRINTING PLATES
Edward M. Redding, Algonquin, Ill., assignor to Printing Plate Supply Co., Chicago, Ill.
Continuation-in-part of application Ser. No. 580,393, Sept. 19, 1966, now Patent No. 3,427,970. This application Jan. 9, 1969, Ser. No. 790,031
Int. Cl. B29c *3/00, 17/00*
U.S. Cl. 18—19 R **8 Claims**



The method of placing plate material including a layer of plastic between at least a first pair of heated dies under pressure, and the repeating of said first step in a second pair of dies under pressure, wherein bearers of greater thickness are used to limit closing of said first pair of dies than bearers used to limit the closing of said second pair of dies.

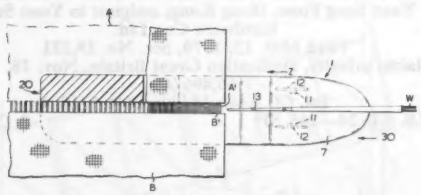
3,613,175
METHOD FOR INDUCING PARTING OF FIBER SLIVER BETWEEN A CONTAINER-FILLING DEVICE AND A CONTAINER
Fritz Schumann, Ingolstadt, and Erich Edler, Zuchering B., Germany, assignors to Schubert & Salzer Maschinenfabrik Aktiengesellschaft, Ingolstadt, Germany
Continuation of application Ser. No. 698,458, Dec. 11, 1967. This application Nov. 3, 1969, Ser. No. 871,637
Claims priority, application Germany, Dec. 17, 1966, Sch 39,983
Int. Cl. B65h *54/80*
U.S. Cl. 19—157 **1 Claim**



Fiber sliver is fed in a known manner into a container through an inclined tube carried by a rotary wheel with its upper inlet end in registry with the axis of the wheel

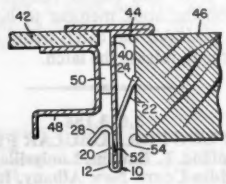
and its lower outlet end offset from the wheel's axis so that the sliver is discharged helically into the container beneath the tube. After the container is filled, rotation of the wheel is stopped in response to actuation of photoelectric sensing means in a rotative position in which the tube is inclined downwardly away from a predetermined established direction in which the container is to be pulled from the filling machine transversely of the wheel's axis. A sharp return bend is formed in the sliver by its being pulled against the side of the tube as the container is moved outward with the sliver held in it, so that further container movement pulls the sliver apart at a location between the tube and the coil in the container.

3,613,176
SLIDER FOR SEPARABLE FASTENERS
James Haythornthwaite and Joseph A. Fardeau, Joliette, Quebec, Canada, assignors to Scapa Dryers (Canada) Ltd., Joliette, Quebec, Canada
Filed Apr. 9, 1970, Ser. No. 26,810
Int. Cl. F16g *3/00*
U.S. Cl. 24—31 H **9 Claims**



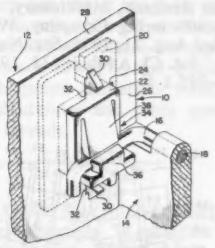
This invention relates to a slider for connecting the ends of paper-making felts, the slider having a pair of vertically spaced grooves laterally offset to one another and having a threading means insertable into the loops of the ends of the felt to connect them together. The invention also relates to a method of connecting the ends of the felt together when employing the slider.

3,613,177
ANCHORING CLIP FOR MOUNTING APPLIANCES
John B. Davis, Big Flats, N.Y., assignor to Corning Glass Works, Corning, N.Y.
Filed July 27, 1970, Ser. No. 58,264
Int. Cl. A44b *21/00*; E03c *1/18*
U.S. Cl. 24—73 B **5 Claims**



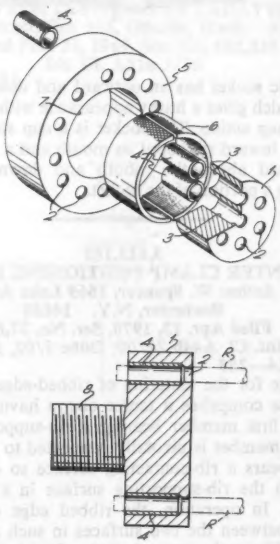
An anchoring clip having a U-shaped clamping portion with an interlocking tab, a gripping arm with bite-in ear portions, and a removal flange, is lockably positioned upon a mounting frame of a drop-in or surface-mounted appliance, such as a sink or cook-top. With a plurality of such anchoring clips secured about the periphery of the mounting frame, the appliance is lowered into position within a pre-cut opening formed in a counter top or the like, and the bite-in ears of the gripping arm are forced into a surface of the counter top surrounding the opening to securely mount and lockably position the appliance within the opening.

3,613,178
PLASTIC CLIP DEVICE
Julian Vernon Fisher, Carpentersville, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.
Filed Dec. 13, 1968, Ser. No. 783,636
Int. Cl. A44b *21/00*
U.S. Cl. 24—73 PF **3 Claims**



A plastic clip for connecting perpendicular panels. The clip has a planar head portion with a rearwardly directed shank portion and prong connector elements. The rear of the shank portion defines a yieldable throat area opening to a socket. The shank portion of the clip is inserted into an opening in one of the panels and held in the opening by the prong connector elements. An arm element is secured to the other panel and the panels are perpendicularly connected by pressing the arm element on the second panel through the yieldable throat into the socket of the clip on the first panel.

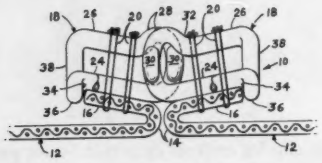
3,613,179
CABLE OR ROD ANCHORING MEANS
William Whittaker, Leeds, England, assignor to C.C.L. Systems Limited, Surbiton, Surrey, England
Filed Aug. 12, 1970, Ser. No. 63,202
Claims priority, application Great Britain, Aug. 20, 1969, 41,565/69
Int. Cl. F16g *11/02*
U.S. Cl. 24—123 W **18 Claims**



A clamping and anchoring device for rods and stranded cables comprising a cylindrical or tubular element having

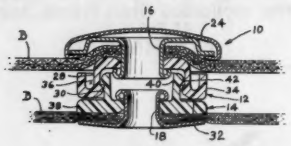
bores and hardened inserts to receive and hold the rods or strands, and a clamping and anchoring structure consisting of two or more of said elements which are mounted and clamped one upon the other.

3,613,180
COIL FOR A SLIDE FASTENER
John Emerson Burbank, Middlebury, Conn., assignor to Scovill Manufacturing Company, Waterbury, Conn.
Filed Aug. 21, 1970, Ser. No. 65,895
Int. Cl. A44b *19/12, 19/34*
U.S. Cl. 24—205.1 C **2 Claims**



A zipper plastic coil is formed at its rearward end with a line of knobs, one on each convolution, the line being parallel to direction of coil for engaging the edge of a tape in an "invisible" type zipper.

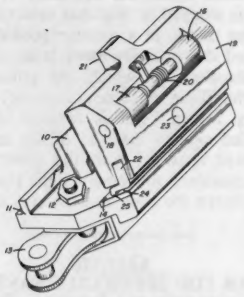
3,613,181
SNAP FASTENER SOCKET
Donald O. Taylor, Waterbury, Conn., assignor to Scovill Manufacturing Company, Waterbury, Conn.
Filed Aug. 26, 1970, Ser. No. 67,065
Int. Cl. A44b *17/00*
U.S. Cl. 24—216 **1 Claim**



A plastic socket has an outward and doubled back extension which gives a husky appearance without sacrificing reliable snap action. The socket is a cup shaped member having an inward rib about its mouth and a flange extending outward about the mouth and downward thereby concealing a portion of the socket.

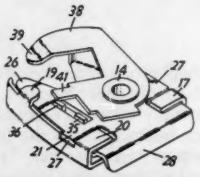
3,613,182
TENTER CLAMP POSITIONING RIDGE
Arthur W. Spencer, 1669 Lake Ave., Rochester, N.Y. 14650
Filed Apr. 13, 1970, Ser. No. 27,852
Int. Cl. A44b *21/00;* **D06c** *3/02, 3/10*
U.S. Cl. 24—253 **4 Claims**

A device for the tentering of ribbed-edge plastic films. The device comprises a tenter clamp having a generally C-shaped first member bearing a rib-supporting surface. A second member is pivotally connected to the first member and bears a rib-contacting surface so disposed as to coact with the rib-supporting surface in a clamping engagement. In operation, the ribbed edge of the film is clamped between the two surfaces in such a manner that the sheet-like web portion of the film is not contacted. Proper clamping engagement is insured by a positioning ridge formed co-extensively with the trailing edge of the rib-contacting surface. The clamp is so constructed that lateral tension exerted on the film during tentering will



cause the clamp to exert increased clamping force on the rib.

3,613,183
END ATTACHMENTS FOR WATCH BRACELETS
Yuen Sang Poon, Hong Kong, assignor to Yuen Sang Hardware Co., Ltd.
Filed Mar. 13, 1970, Ser. No. 19,321
Claims priority, application Great Britain, Nov. 18, 1969, 56,496/69
Int. Cl. A44b *13/00;* **A44c** *5/18*
U.S. Cl. 24—265 SH **8 Claims**

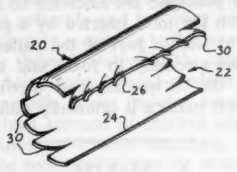


An end attachment for a bracelet, comprising a fixed base adapted to be secured to the end of the bracelet, a hook member mounted on the base for swivelling movement about an axis normal to the said plane between a closed position in which an end of the hook member forms with the base an enclosed aperture and an open position in which the said end of the hook member is spaced away from the base to form a gap in the periphery of said aperture, and a catch mounted on the base and resiliently urged into a first position in which, when the hook member is in said closed position, the catch engages a latch on the hook member to hold said member in said closed position, the catch being movable against the resilient force to release the latch.

3,613,184
SPRING CLIPS FOR TUBULAR FURNITURE
Armand T. Rankin, Louisville, Ky. (1614 Heddin Court, New Albany, Ind. 47150)
Filed July 28, 1970, Ser. No. 58,880
Int. Cl. A47c *31/00*
U.S. Cl. 24—265 C **4 Claims**

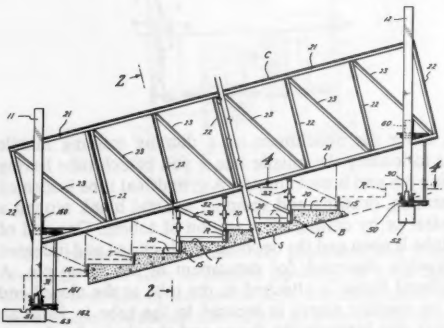
Outdoor, casual and patio furniture is frequently made from tubular frames having interwoven or crossed straps which are secured at their ends to the frame and are stretched across the furniture piece. During the life of the furniture piece, therefore, it is usually the practice to replace the straps one or more times. Desirable means of securing straps to tubular furniture entail the use of fasteners or clips. Prior art clips, while affording a particularly useful means of attaching straps to furniture pieces, are nevertheless subject to certain disadvantages. The clips

provided herein overcome these problems. They function very well on square tubular frames, and in addition the



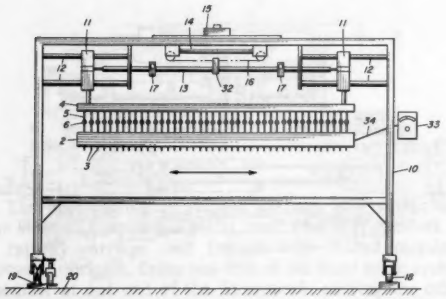
surrounding strap need not be wound around to the degree necessary with prior art clips.

3,613,185
CONCRETE SHAPER APPARATUS
George A. Hacker, Houston, Tex., assignor to H. A. Lott, Inc., Houston, Tex.
Filed Mar. 26, 1969, Ser. No. 810,455
Int. Cl. B29b *7/22*
U.S. Cl. 25—118 S **9 Claims**



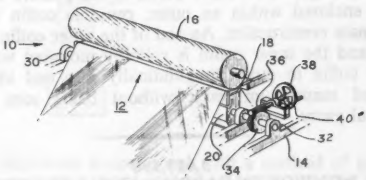
Concrete shaper apparatus having power means for moving same, and a method, for shaping a plurality of concrete stadium risers and treads, or a similar structure, continuously as the apparatus is moving.

3,613,186
APPARATUS FOR PRODUCING SCULPTURED EFFECTS ON PILE FABRICS
Charles P. Mazzone, Dover, and Herbert J. Pike, Martinsville, N.J., assignors to J. P. Stevens & Co., Inc., New York, N.Y.
Filed Oct. 7, 1969, Ser. No. 864,437
Int. Cl. D06c *23/00, 29/00*
U.S. Cl. 26—2 R **9 Claims**



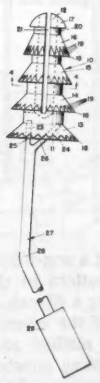
An apparatus and process is described for moving a series of jets in two directions over a fabric, which may also be moving, or in one direction if the fabric motion provides the other, or the jets may be stationary and the fabric moving in one or more directions. The jets are in a heater manifold and individually supplied by connectors having individual micrometric valve adjustments, the heater head being adjacent the jets and the air and control valves being located where they are not at high temperature. Means are also described for tilting the jet heads so that the jets may direct hot fluid, such as hot air, at an angle which is adjustable from 90°. The blast of hot fluid from the heated jets softens the nap or pile of the fabric and also bends it down, so that a sculptured effect is produced which resists numerous washings. Typical fabrics are napped acetates and other synthetic fabrics with thermoplastic threads.

3,613,187
CLOTH SHEAR WITH CHANGEABLE REST
William J. Holm, Springfield, Vt., assignor to Riggs & Lombard, Inc., Lowell, Mass.
Filed July 14, 1969, Ser. No. 841,201
Int. Cl. D06c *13/00*
U.S. Cl. 26—15 R **1 Claim**



A machine for shearing a running fabric web is provided with a changeable rest mechanism by which any one of a plurality of different rests can be moved into operating position. A rotatable shaft carries a single edge hard rest and a multiple edge gap rest angularly spaced from one another and either of which may be rotated into position and locked.

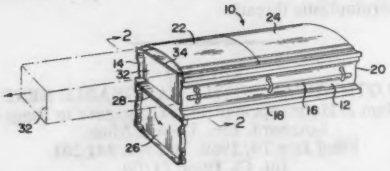
3,613,188
PLUG FOR OPENINGS IN CADAVERS
Ted Muscott, Box 315, Othello, Wash. 99334
Filed Feb. 24, 1969, Ser. No. 801,331
Int. Cl. A01n *1/00*
U.S. Cl. 27—21 **5 Claims**



A tapered plug having plural annular series of anchors, a central bore containing an absorbent material and quadrilateral openings into the bore; the base or large end

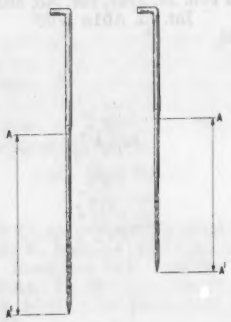
being circumferentially uninterrupted and impervious and having sockets adapted to cooperate with an applicating implement exposed at the base end.

3,613,189
END EJECTING COFFIN
Donald R. Kirby, 637 Carey Place, Lakeland, Fla. 33803
Filed Mar. 19, 1970, Ser. No. 21,088
Int. Cl. A61g *17/00*
U.S. Cl. 27—35 **7 Claims**



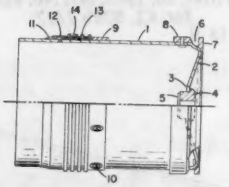
A coffin adapted for use in mausoleum burials. The device comprises an inner coffin of inexpensive construction, enclosed within an outer, reusable coffin which is of ornate construction. An end of the outer coffin is openable and the inner coffin is rollably mounted within the outer coffin to move longitudinally into and above the ground mausoleum vault without being seen by the funeral party.

3,613,190
NONWOVEN FABRICS AND A PROCESS FOR MAKING THEM
David Winston Crosby, Cwmbran, England, assignor to Imperial Chemical Industries Limited, London, England
Continuation-in-part of abandoned application Ser. No. 578,637, Sept. 12, 1966. This application July 13, 1970, Ser. No. 54,121
Claims priority, application Great Britain, Sept. 13, 1965, 38,990/65
Int. Cl. D04h *18/00*
U.S. Cl. 28—4 R **8 Claims**



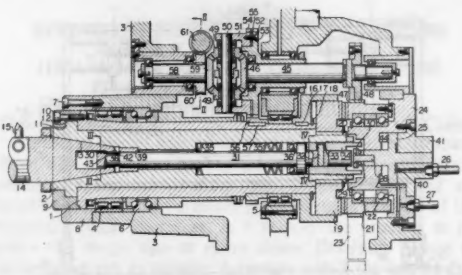
A process for making a non-woven fabric having a predetermined repeating pattern of closely spaced tufts by the technique of moving a fibrous assembly along a path which is in the plane of the assembly and needle punching the assembly, said method comprising: arranging a plurality of pattern-forming punching needles in each of a plurality of sets and spacing the sets along the path of travel of the assembly, each set containing only a proportion of the total number of needles necessary to produce the predetermined tuft pattern; driving said needles into the fibrous assembly to produce a number of tufts less than the total number required for the pattern; forwarding the assembly along said path a distance such that each needle set will penetrate the assembly to form additional tufts which with the tufts inserted by a preceding needle set will form at least a part of the pattern; driving said needles into the assembly to form said additional tufts; and repeating the forwarding and needle driving steps whereby the tuft pattern is gradually built up.

3,613,191
MISSILE COVER AND METHOD OF MAKING THE COVER
Violet C. Minnich and Walter J. Krueger, Huntsville, Ala., assignors to the United States of America as represented by the Secretary of the Army
Filed Dec. 1, 1969, Ser. No. 881,031
Int. Cl. B23p *15/22*
U.S. Cl. 29—1.4 **3 Claims**



A cover for attachment on a dummy training missile prior to loading the missile into a gun breech tube having a firing pin and breech fingers. A cylindrical tube is formed by heating, drawing and spinning a metal blank around a mandrel or by cutting off a section of tubing. One end of the tube is open and the opposite end is closed and indented to provide clearance for movement of the firing pin. A peripheral flange is attached to the tube at the closed end and an annular sleeve is secured to the tube to form an annular slot between the flange and the sleeve for breech finger engagement. An attachment ring is secured to the cylindrical tube and a hoop adapter is mounted for movement on the tube. Metallic and flexible ring spacers are alternately placed between the attachment ring and the adapter to allow movement of the adapter when loading the missile into the gun breech tube.

3,613,192
TOOL SPINDLE ASSEMBLY
Yutaka Tanabe and Masaharu Tajima, Kawasaki, Japan, assignors to Ikegai Tekko Kabushiki Kaisha, Tokyo, Japan
Filed July 7, 1969, Ser. No. 839,723
Int. Cl. B23b *39/02, 19/02, 47/00*
U.S. Cl. 29—26 **1 Claim**



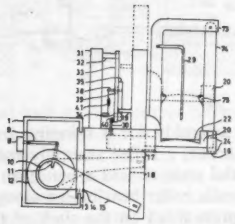
A main spindle device comprises a main tool spindle of such construction, wherein an inner spindle member is arranged in a rotatable outer sleeve member in such a

relation that the center axis of said inner member is parallel with, and eccentric by a predetermined amount to, the axis of rotation of said outer member. Said inner member is also rotatable and provided with an eccentric opening for mounting a suitable tool holder or boring bar, the eccentricity thereof relative to the center axis of said inner member being equal to said predetermined amount. Therefore the spindle device includes means for effecting any predetermined amount of relative angular deviation between said inner and outer members, so that a tool mounted on the tool holder may be accurately adjusted for a given rotational radius or a radial depth of a cut thereof.

3,613,193
APPARATUS FOR MOUNTING VENETIAN BLIND SLATS

Bertil Westberg, Rombergsgatan 32, Enkoping, Sweden

Filed Feb. 7, 1969, Ser. No. 797,499
Claims priority, application Sweden, Feb. 9, 1968, 1,746/68
Int. Cl. B23p *19/04*
U.S. Cl. 29—24.5 **9 Claims**

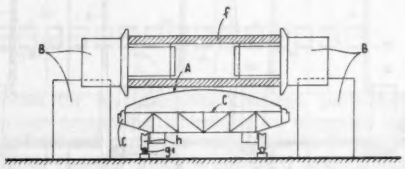


A Venetian blind assembling apparatus for inserting Venetian blind slats in aligned openings in cord ladders. During insertion of successive slats, the cross cords of the ladders are positioned alternately to respectively one side and the other side of the usual lift-cord-receiving holes formed in opposing end portions of each slat. Thus, during mounting of the lifting cords in the Venetian blind, they are inserted in a zig-zag configuration between the cross cords of the cord ladders.

3,613,194
METHOD AND MEANS FOR PRODUCING A RAILWAY CARRIAGE ROOF

Francois Colas, Bourg-la-Reine, France, assignor to Cegedur G.P., Paris, France

Filed June 30, 1969, Ser. No. 837,544
Claims priority, application France, July 11, 1968, 158,743
Int. Cl. B60j *7/12*; E04b *7/14*
U.S. Cl. 29—33 E **7 Claims**

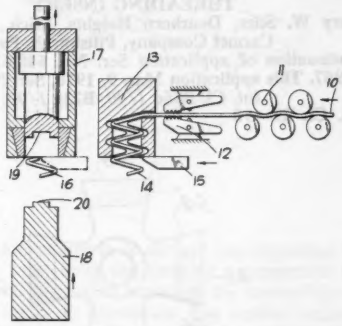


The manufacture of railway carriage roof comprising the steps of unrolling a metal band over a framework of a railway carriage roof formed with arched members between uprights, fixing one end of the band to an arched member at one end of the framework, curving the other end of the band in the transverse direction so that it assumes the shape of the arched members, tensioning the band and nailing the band to the frame-work along the side members and then along the other end of the arched members, and then separating the framework from the unused portions of the band.

3,613,195
METHOD OF MAKING FILTER RINGS

Kenneth Senior, Frinton-on-Sea, Essex, England, assignor to Stella-Meta Filters Limited, Laverstoke, near Whitchurch, Hampshire, England

Filed Apr. 2, 1969, Ser. No. 812,633
Claims priority, application Great Britain, Apr. 2, 1968, 15,803/68
Int. Cl. B23p *17/00*
U.S. Cl. 29—412 **6 Claims**

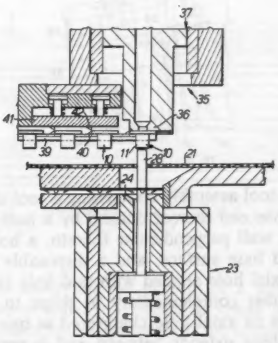


The disclosure is concerned with a method of producing filter rings of the kind comprising an annulus having shallow projections projecting from the face thereof. Waste of metal is avoided by forming the annulus from a wire. The wire is first formed into a helical coil, which is subdivided into its separate convolutions, and each convolution is then flattened. By using a die to achieve flattening, the projections on the annulus may be formed simultaneously.

3,613,196
APPLICATION OF VENTILATORS AND SIMILAR FITTINGS TO ARTICLES OF UPHOLSTERY

Leslie Thomas Docker, Chadwick End, England, assignor to Slumberland Group Limited, Tyseley, Birmingham, England

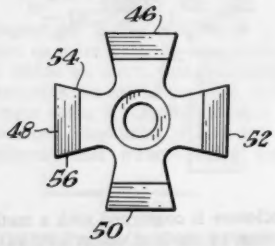
Filed Sept. 11, 1969, Ser. No. 857,100
Claims priority, application Great Britain, Sept. 11, 1968, 43,126/68
Int. Cl. B68g *7/12*
U.S. Cl. 29—91 **8 Claims**



The invention is concerned with the mounting of ventilators and other fittings, such as handle anchorages, on mattresses and other articles of upholstery. Known fittings

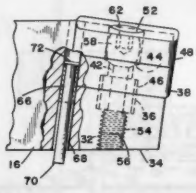
and retaining washers are employed. Each fitting has a neck which extends through a hold in the article and a head which lies on one side of the article. Each retaining washer comprises a plate with an aperture for the neck of the associated fitting and tongues which allow the neck to be pushed into the aperture but strongly resist its withdrawal. The invention provides bands of fittings and bands of retaining washers, and apparatus which severs a fitting and a washer from the bands, guides them to opposite sides of the article, passes the neck of the fitting through a preformed hole in the article and into the aperture in the retaining washer.

3,613,197
THREADING INSERT
Henry W. Stier, Dearborn Heights, Mich., assignor to Carmet Company, Pittsburgh, Pa.
Continuation of application Ser. No. 648,677, June 26, 1967. This application Mar. 9, 1970, Ser. No. 17,026
Int. Cl. B26d *1/00*; B23g *1/00*
U.S. Cl. 29—95 **4 Claims**



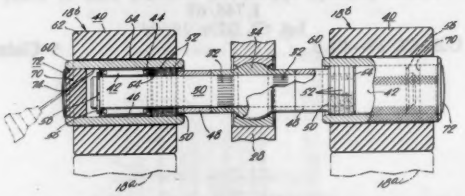
An indexable and reversible threading or grooving insert having a hub portion and a plurality of radially extending projections therefrom, each of said projections being substantially identical in size and shape, each of said projections having a pair of cutting edges on either side of the projection. Insert support means are also provided to support the operative cutting edge on the underside of its projection.

3,613,198
CUTTING TOOL ASSEMBLY
Emil W. Weber, 924 Marbrook Lane, York, Pa. 17404
Filed Sept. 19, 1969, Ser. No. 859,397
Int. Cl. B26d *1/00*
U.S. Cl. 29—96 **6 Claims**



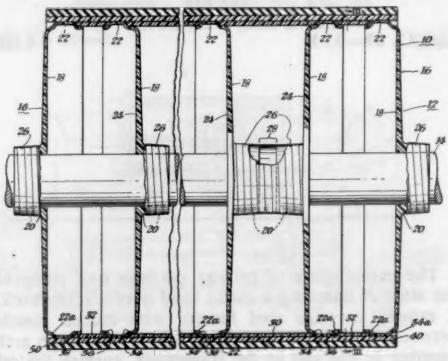
A cutting tool assembly comprising a tool shank having a recess in one end thereof defined by a base surface and at least one wall perpendicular thereto, a hole extending through said base surface, and a disposable cutting tool having an axial hole aligned with said hole in said shank. A seat member complementary in shape to said cutting tool also has an axial hole chamfered at one end and an annular bushing extends between and is received within complementary recesses in said base surface and seat member to secure the same against movement within planes parallel thereto. A locking pin threaded on one end is threaded into the hole in said base surface of said tool shank and the opposite end is received within the hole in said disposable cutting tool, while an intermediate portion is complementary to the chamfer of the hole in the seat member and is operable to wedge the cutting tool within said recess in said tool shank when the pin is threaded into the hole in the recess of the shank and also permit ready release of said cutting tool when a limited amount of unthreading movement of said locking pin occurs relative to the tool shank.

3,613,199
TOP ROLL ASSEMBLY FOR SPINNING FRAMES
Paul E. Duquette, 108 Homestead Drive, Doylestown, Pa. 18901
Filed July 16, 1969, Ser. No. 848,258
Int. Cl. B21b *13/02*
U.S. Cl. 29—116 **2 Claims**



A top roll assembly for a spinning frame comprising an elongated arbor, a roller assembly rotatably mounted at opposite axial ends of said arbor, each roller assembly including a needle roller bearing, an elongated cylindrical arbor sleeve press fitted on the shell of the needle roller bearing, a cot made of a resilient material secured to the outer peripheral surface of said arbor sleeve, a plurality of washer elements confronting one axial end of the needle roller bearing and disposed interiorly of said arbor sleeve, a rubber plug mounted in the opposite axial end of said arbor sleeve and a cap member press fitted in the outer end of said arbor sleeve over said plug.

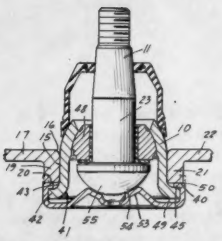
3,613,200
REINFORCED PLASTIC SHELL STRUCTURES AND METHODS AND MEANS FOR CONSTRUCTING THE SAME
Leonard S. Meyer, Columbia, S.C., assignor to McCreary Industrial Products Company, Inc., Indiana, Pa.
Filed Oct. 29, 1968, Ser. No. 771,407
Int. Cl. B21b *31/08*
U.S. Cl. 29—132 **16 Claims**



I disclose a reinforced plastic shell structure mountable upon a shaft or the like, said structure including a pair of spaced end discs fabricated from laminated

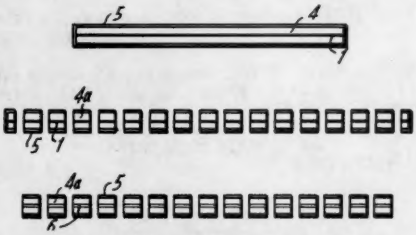
layers of plastic and reinforcing material, each of said discs having a rim structure and a hub, at least some of said reinforcing layers extending at least partially into said rim and said hub, and a reinforced plastic shell section extending between said rims and adhered thereto.

3,613,201
STAMPED BALL JOINT ASSEMBLY AND METHOD OF MAKING SAME
Edward J. Herbenar, Detroit, Mich., assignor to TRW Inc., Cleveland, Ohio
Filed Jan. 20, 1970, Ser. No. 4,183
Int. Cl. B23p *11/00*; B21d *39/00*
U.S. Cl. 29—149.5 B **7 Claims**



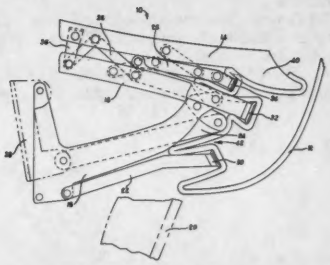
A movable stud ball joint assembly having a stamped cup-shaped housing with an open top and bottom with an outturned flange around the open top end. A closure cap is used to close the open top and has a circumferential inturned flange spin-swedged over the outturned flange of the housing to provide a squared flat surface to abut the side of the member in which the housing is inserted.

3,613,202
METHOD OF MANUFACTURING BEARINGS, PARTICULARLY MICROBEARINGS
Robert Soder, Territet, Switzerland, assignor to Ebauches S.A., Neuchatel, Switzerland
Filed Feb. 7, 1969, Ser. No. 797,580
Claims priority, application Switzerland, Feb. 29, 1968, 3,063/68
Int. Cl. B21d *53/10*
U.S. Cl. 29—149.5 NM **12 Claims**



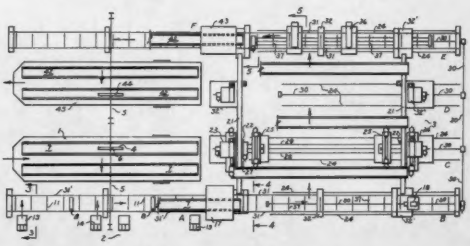
A process for manufacturing bearings, particularly microbearings comprising, embedding an elongated support in at least one particular material so as to produce a bar of this material which is traversed longitudinally by the support, slicing the bar into fragments the thickness of which corresponds to the weight of the bearings to be manufactured, exposing these fragments to the action of a support-etching agent so as to destroy the material of the support in the fragments and thus producing therein a longitudinal hole, which includes providing around the support a gradient of particles of the particular material, said particles being progressively deposited and agglomerated on the support, this resulting in progressive embedment of the support.

3,613,203
METHOD AND APPARATUS FOR CONSTRUCTING CONVERTIBLE TOP LINKAGES
Raymond J. Allds, Ashtabula, Ohio, assignor to Ashtabula Bow Socket Company, Ashtabula, Ohio
Continuation-in-part of application Ser. No. 638,492, May 15, 1967, now Patent No. 3,490,120, dated Jan. 20, 1970. This application Jan. 7, 1970, Ser. No. 874,980
The portion of the term of the patent subsequent to Jan. 20, 1987, has been disclaimed
Int. Cl. B23p *17/04, 19/00*
U.S. Cl. 29—155 **13 Claims**



This invention relates to a method and apparatus for deburring the rails, bows and links of a convertible top framework so as to prevent tearing of the convertible top material and injury to passengers. The method includes the use of novel, opposed-force deburring rollers which act on opposite edges of elongated sheared sheet metal blanks that are to form the framework elements. Pivoted arms support the rollers so that fluid driven pistons, such as hydraulic or air or air-hydraulic actuators, acting through the arms can supply the force for deburring even as the width dimension of the elongated blanks varies. The mechanism to accomplish the deburring provides for a changing lateral movement of the piston which drives the arm to accommodate the arc made by the pivoting arm during reciprocal movement of the piston.

3,613,204
OVERALL PROCESSING OF STRUCTURAL MEMBERS
John R. McConnell, 148 Woodside Ave., Ridgewood, N.J. 07450
Continuation-in-part of application Ser. No. 737,654, June 17, 1968, now Patent No. 3,546,772. This application Jan. 20, 1970, Ser. No. 4,360
Int. Cl. B23p *17/00, 19/00, 21/00*
U.S. Cl. 29—155 R **3 Claims**



The process comprises the placing of a trailer of raw structural shapes under an overhead crane alongside a longitudinally-arranged apparatus for the coping, cleaning, drilling, attachment of details, bolting and painting of members in a single continuing handling of the work material. It includes hoisting, placement, longitudinal movement and transfer of the shapes to apparatus for transverse movement to pre-located plural fabricating

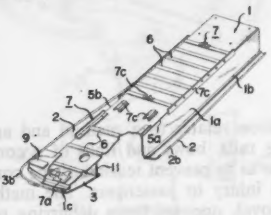
units for simultaneous execution of all required fabricating operations. The completely finished members are then moved longitudinally to a dual longitudinal track for hoisting and placement on an empty outbound trailer for shipment. The mechanized apparatus can automatically and precisely measure, layout and execute any combination of various fabricating operations required for all different types of beams and girders.

3,613,205

METHOD OF MAKING A FRAME ASSEMBLY OF AN ENDLESS-BELT TRACTION MIDGET SNOW VEHICLE

Norio Takada, Hamamatsu-shi, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Hamakita-shi, Shizuoka-ken, Japan

Filed Mar. 25, 1969, Ser. No. 810,260
Claims priority, application Japan, Mar. 30, 1968, 43/20,661
Int. Cl. B23p *17/00, 19/00*
U.S. Cl. 29—155 6 Claims



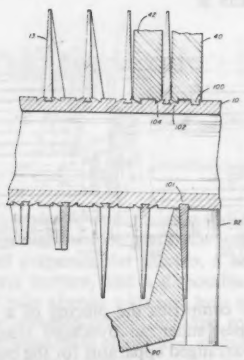
A vehicle frame assembly consists of an inverted channel-shaped plate having stepped strips formed along the flanges, a pair of foot step plates welded to the stepped strips of the inverted channel-shaped plate in a manner to extend along the free edge of the flange of said channeled plate, and a front bottom plate for supporting a pair of a skis which is welded to the front bottom of said channeled plate. The plates are assembled after complementary parts are attached to any one or ones of said plates.

3,613,206

ROLLED GROOVE FIN TUBE

Arthur H. McElroy, 2789 E. 45th Place, Tulsa, Okla. 74105

Filed May 7, 1969, Ser. No. 822,647
Int. Cl. B23p *15/16, 15/26*
U.S. Cl. 29—157.3 AH 8 Claims



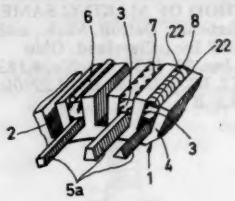
A fin tube formed by a combination of groove forming and backfilling helically wound fins substantially integral with tubing. Groove forming and backfilling rollers are combined in cooperation with the fin forming mechanism.

3,613,207

METHOD FOR COVERING AND CLOSING COOLING CHANNELS OF A COMBUSTION CHAMBER

Werner Adolf Malburg, Ottobrunn, Germany, assignor to Messerschmitt-Bolkow Gesellschaft mit beschrankter Haftung, Munich, Germany

Filed June 5, 1969, Ser. No. 830,743
Int. Cl. B21d *53/00;* B21k *29/00;* B23p *15/26*
U.S. Cl. 29—157 C 13 Claims



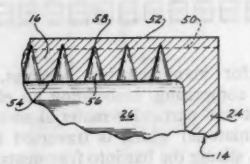
A method for covering and closing cooling channels which are defined in a combustion chamber wall includes inserting wire rods over the radially outer opened ends of the channels between longitudinally extending webs which define the channels and establishing a permanent connection of the wire rods to the webs such as by welding or soldering. A combustion engine particularly rocket engine is formed preferably with a cylindrical main combustion chamber portion having a narrow throat section terminating in a nozzle discharge for the thrust gases and with longitudinally extending grooves for cooling fluid which extend along the complete length of the combustion chamber and including the nozzle section. Spacers or templates are inserted into the bottom of the grooves from each end of the combustion chamber and they abut for example, in the narrow throat section. Thereafter wire rods are pressed into the grooves between the webs of the wall up to the limit of the templates and they are secured to the walls such as by electronic welding, by brazing using a soldering rod or by shield gas welding. Instead of using templates the rods may be formed with transverse supports or projecting shoulders or the webs may be formed with a step or shoulder to position the rod up to the desired groove penetration.

3,613,208

METHOD OF FABRICATING A PERFORATED PANEL FOR A VACUUM WORK-HOLDER OR CHUCK

Harold A. Seberg, 10741 Spring St., Sturtevant, Wis. 53177, and Leo E. Fitzgerald, 8710 Clover Lane, Racine, Wis. 53406

Filed Aug. 20, 1968, Ser. No. 754,053
Int. Cl. B23p *15/16;* B22d
U.S. Cl. 29—163.5 R 2 Claims



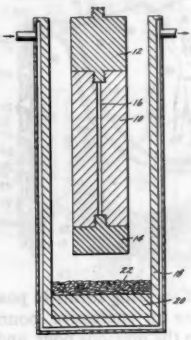
This disclosure comprises a fixture or chuck employed to hold work-pieces while the latter are being machined, and is especially intended to hold such pieces that cannot be conveniently clamped, or to hold those of non-magnetic material that cannot be held on a magnetic chuck. This disclosure comprises a vacuum chamber provided with orifices in the work-holding surface thereof. A

vacuum is maintained in the chamber to hold the workpieces which have been placed upon the surface, thereby closing the orifices. This disclosure primarily relates to the method of producing the orifices in the surface of the device.

3,613,209
PROCESS FOR MANUFACTURING GOLD ALLOY WATCH CASINGS
Ervin Piquerez, Bassecourt, Switzerland
No Drawing. Continuation-in-part of application Ser. No. 685,956, Nov. 27, 1967, which is a continuation-in-part of application Ser. No. 437,592, Mar. 5, 1965, now abandoned. This application Dec. 9, 1969, Ser. No. 883,588
Int. Cl. B23p *13/00*
U.S. Cl. 29—179 10 Claims

A process for manufacturing watch casings composed of gold or gold alloy is disclosed. A suitable gold alloy is melted with an oxidization inhibiting metal in an inert gas and the molten metal is then injection molded into the shape of a watch casing. The watch casing is then heat treated for two to five hours at a temperature near 400° C. to eliminate internal strains formed during the molding operation. Finally the watch casing is surface hardened and polished whereupon it is ready for commercial use.

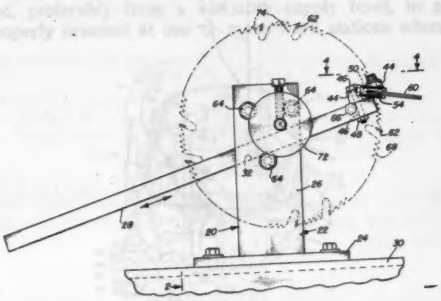
3,613,210
ARC CAST INGOT
Winston H. Chang, Cincinnati, Ohio, assignor to General Electric Company
Filed June 6, 1966, Ser. No. 555,483
Int. Cl. B21c *1/00, 27/00*
U.S. Cl. 29—187 3 Claims



A vacuum arc melted ingot central portion of a high temperature alloy based on one of the refractory metal elements or on Fe, Ni or Co is substantially crack-free through provision of an integral ingot top portion of at least one inch nominal thickness of the unalloyed element on which the alloy is based.

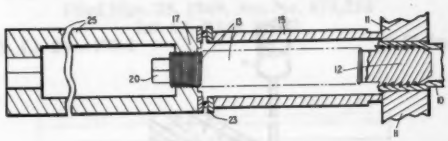
3,613,211
DEVICE FOR POSITIONING AND ADJUSTING RELATIVELY HARD TEETH TO THE TEETH OF A CIRCULAR SAW
Byron G. Gaggett, 3836 Centraloma Drive, San Diego, Calif. 92108
Filed Oct. 7, 1969, Ser. No. 864,359
Int. Cl. B23p *19/00*
U.S. Cl. 29—200 P 10 Claims

A device for positioning and adjusting relatively hard teeth to tooth holders of steel, circular saws. The device includes a frame and an assembly of elements and pivots whereby the support for the hard tooth can be swung horizontally from a position in which the hard tooth thereon is aligned with the tooth holder on the saw and swung



out of such aligned position. The assembly can be adjusted to positions corresponding to the desired shape of the cutting faces of the hard teeth.

3,613,212
TAP FOR REMOVING TUBES FROM TUBE SHEETS
Charlie D. Miller, Syracuse, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.
Filed July 22, 1969, Ser. No. 843,361
Int. Cl. B25b *27/06*
U.S. Cl. 29—202 5 Claims

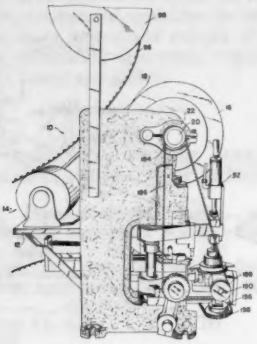


The tube pulling tap is formed with a thread, the force applying side of the helixes of the thread confronting the shank of the tap inclining from the crest of the threads toward the roots thereof in a direction from the shank. Accordingly, the tube is not cammed outwardly into tighter engagement with the tube sheet but conversely is contracted inwardly resulting in axial withdrawal of the tube from the sheet with less applied force.

3,613,213
STAKING MACHINE
Dirk Landman, Mechanicsburg, and Edmund G. Pinger, Freeland, Pa., assignors to Berg Electronics, Inc., New Cumberland, Pa.
Original application Nov. 1, 1967, Ser. No. 679,675. Divided and this application July 22, 1969, Ser. No. 870,890
Int. Cl. H05k *13/04*
U.S. Cl. 29—203 B 17 Claims

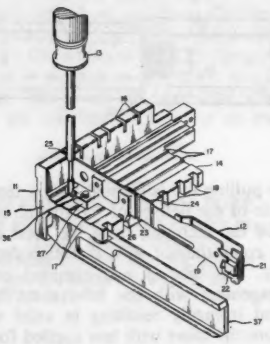
A machine is provided for successively staking terminals onto an arcuate or semi-circular terminal board. The terminal board is of the type used in electrical apparatus. The staking structure is provided in a punch press which has a lower fixed die shoe and an upper movable die shoe. The lower die shoe carries a support structure for the terminal board. The support structure is mounted on a spring so that it will be depressed during the staking operation. Clamp means are provided to releasably secure the terminal board onto the support structure. The clamp

means permit slight tilting of the board during staking to result in good seating of terminals. Additional roller



clamp means are provided for firm pressure engagement with the outer rim of terminal boards.

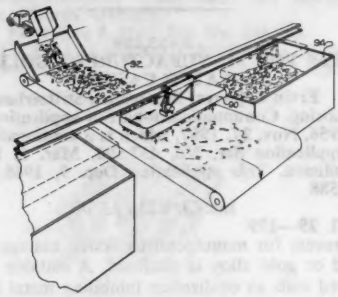
3,613,214
APPARATUS FOR MOUNTING A HEAD/ARM ASSEMBLY
Steven J. MacArthur, San Jose, Calif., assignor to Information Storage Systems, Inc., Gupertino, Calif.
Filed Jan. 16, 1970, Ser. No. 3,321
Int. Cl. B23p *19/00*
U.S. Cl. 29—200 P **3 Claims**



Apparatus for mounting a head/arm assembly in a disk storage drive including a flange on the assembly, a tool for cooperation with a portion of the flange, means for converting rotary motion of the tool into axial movement of the assembly and means for clamping the flange to secure the assembly in a selected position.

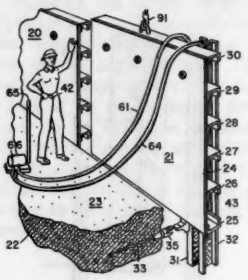
3,613,215
PROCESS FOR COLLECTING WASTE MATERIALS
James F. Uhl, P.O. Box 11065, Charlotte, N.C. 28209
Filed June 16, 1970, Ser. No. 46,722
Int. Cl. B23g *17/00;* **B23p** *19/00;* **B23q** *7/00*
U.S. Cl. 29—403 **10 Claims**

A process for collecting and removing waste or litter in the form of non-magnetic containers, wherein a sufficient quantity of a magnetically attractive material has been assembled with the container to permit the same to be moved or lifted by a magnetic field. If the container is deposited as waste or litter in a public place by the consumer, it may then be moved or lifted by a magnet into a suitable receptacle for proper disposal. Reuseable materials collected in this manner may then be separated from



non-reuseable materials, and recycled into new products.

3,613,216
METHOD FOR SECURING FORMS FROM A POSITION OF SAFETY
Chester I. Williams, 347 Greenbriar S.E., Grand Rapids, Mich. 49506
Original application June 5, 1967, Ser. No. 643,453, now Patent No. 3,464,666, dated Sept. 2, 1969. Divided and this application Mar. 21, 1969, Ser. No. 833,221
Int. Cl. B23p *19/00*
U.S. Cl. 29—428 **4 Claims**

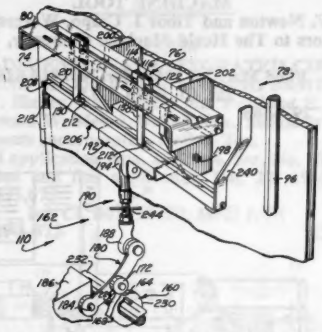


A mechanism for securing forms in position to develop a concrete structure in successive pours, including an anchor embedded in the previous pour, and a coupling unit on the form, the coupling unit being extendable to a position for engagement with means fixed with respect to the anchor when the form is set back from the formed face of the concrete, the coupling unit being retractable by a device controllable from the face side of said form to draw the form into engagement with the formed face; and the method of securing a form from the face side.

3,613,217
STITCHER ASSEMBLY
Howard R. Perkins, Grafton, Ohio, assignor to Harris-Intertype Corporation, Cleveland, Ohio
Filed Jan. 9, 1970, Ser. No. 1,680
Int. Cl. B42c *1/12*
U.S. Cl. 29—432.2 **16 Claims**

An improved stitcher assembly for stapling groups of sheets in succession includes a stapler head operated cyclically with an automatic sheet feeding mechanism for driving a staple into each group of sheets in turn. A clincher assembly is actuated to clinch a staple from the opposite side of a group of sheets upon each operation of the stapler head. The clincher assembly is also additionally actuated between successive operations of the

stapler head to eject clinched staples from the clincher assembly in the event sheets were not present during the previous stapling operation. In this manner, staples which were clinched while sheets of material were absent are automatically ejected from the clincher assembly before



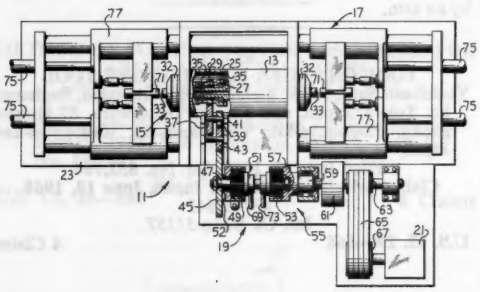
a next succeeding stapling operation to eliminate the need for discontinuing the stapling operation during the time sheets are absent, and at the same time to protect the stapler head and clincher assembly against damage from unused clinched staples lying on the clincher assembly.

3,613,218

WELDER POWER AND DRIVE SYSTEM

Jozef Kiwalle, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 25, 1969, Ser. No. 852,782
Int. Cl. B23k *27/00*
U.S. Cl. 29—470.3 **2 Claims**



A power and drive system for an inertia welding machine having a power section connected to a gear train through a selectively actuatable clutch and brake. The drive train portion is connected to the rotating spindle of the machine through a one-way clutch. When the machine reaches welding speed, the selectively actuatable clutch is deactivated, the brake is actuated, and the one-way clutch allows the spindle to continue to rotate without having the flywheel or drive train mass WK^2 added thereto.

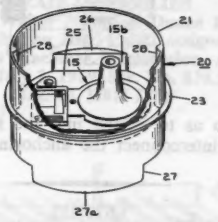
3,613,219

METHOD OF MANUFACTURING PIECE PARTS

Everett H. Fisher, Wilkinson, Ind., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed Oct. 8, 1969, Ser. No. 864,652
Int. Cl. B23p *17/00*
U.S. Cl. 29—423 **8 Claims**

A universal die cast or molded ring is formed with a flat outer rim of appreciable width and an integral inner web extending across the rim other than in a central region thereof. One or more parts, which may have irregular profiles and/or complex contours, are initially integrally formed with, and located within the central region of, the web. In accordance with the method, the rings, including the parts supported thereby, are successively fed, preferably from a vibratory supply bowl, to and properly oriented at one or more work stations whereat



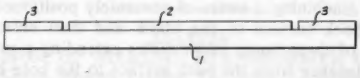
various machining operations are to be performed on the parts. Thereafter, each part is trimmed from the thin web of the associated ring and the latter is then fed along a vibratory track back to reclamation apparatus, whereat the ring is re-melted when formed of metallic die cast material or reground when formed of plastic material for subsequent use in forming a new ring-piece part combination.

3,613,220

METHOD OF FORMING TRANSITION INSERT MATERIAL

Walter D. Finnegan, Concord, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Nov. 25, 1969, Ser. No. 879,752
Int. Cl. B23k *31/02*
U.S. Cl. 29—472.1 **8 Claims**



A method for forming long lengths of trilayer and bilayer composite material for transition inserts comprising preparing a prebond pack containing at least an aluminum facing plate, a ferrous plate, and aluminum side bars, having substantially the same deformability as the facing plate, attached to face of the aluminum plate adjacent to the ferrous plate, heating the pack to a temperature between 400 and 900° F. and subjecting the pack to a one-step reduction to reduce the thickness of the aluminum materials adjacent to the ferrous element by at least 12%, preferably between 20 and 50%.

3,613,221

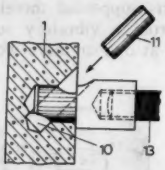
METHOD FOR CONNECTING AN ANCHORING DEVICE TO THE REAR OF A FRONTAL PLATE OR THE LIKE

Cornelis Jan Pronk, Castricum, Netherlands, assignor to N.V. Bataafsche Aanneming Maatschappij v/h F.a.J. van der Wal & Zoon, Amsterdam, Netherlands

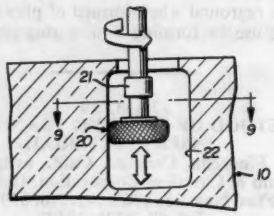
Filed Mar. 17, 1969, Ser. No. 808,017
Claims priority, application Netherlands, Mar. 18, 1968, 6803835
Int. Cl. B23p *19/00*
U.S. Cl. 29—526 **6 Claims**

A method of connecting an anchoring device to the rear surface of a frontal plate including providing a blind hole in the rear surface of the frontal plate, inserting a projecting end portion of the anchoring device into the blind hole, providing a second blind hole in the frontal

plate extending transversely through said first blind hole in alignment with a transversely positioned bore in said projecting end portion, and insert a pin into the transverse bore so as to extend into the second blind hole and thereby interconnect the anchoring device and the frontal plate.

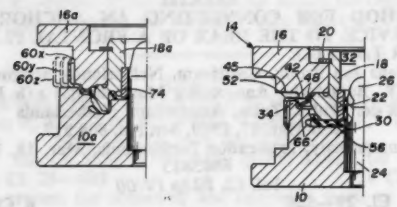


3,613,222
METHOD FOR MAKING A LIGHTWEIGHT OPTICAL MIRROR
Charles E. Richey, Ottawa Lake, Mich., assignor to Owens-Illinois, Inc.
Filed June 23, 1969, Ser. No. 835,612
Int. Cl. B23p *13/04, 17/00*
U.S. Cl. 29—527.1 **18 Claims**



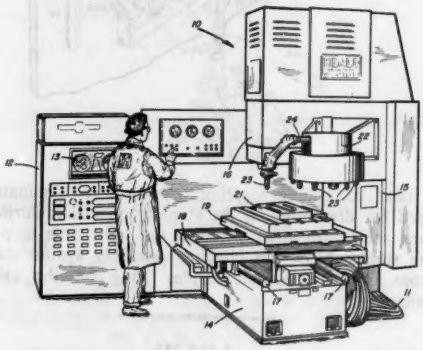
Method and apparatus for lightweighting mirror blanks by first machining a series of accurately positioned bores in the back surface of the blank and then enlarging a portion of these bores into cavities extending a predetermined distance from the back surface to the bore bottom. The enlargement of these cavities is done by an apparatus which reciprocates an air driven tool along the bore walls and also moves the tool around the bore first in a circular path and then in a non-circular path.

3,613,223
METHOD AND APPARATUS FOR MAKING FLUID SEALS
Jack A. Bush, Birmingham, Mich., assignor to Garlock Inc.
Continuation of application Ser. No. 559,549, June 22, 1966. This application Oct. 13, 1969, Ser. No. 866,167
Int. Cl. B23p *17/00, 25/00*
U.S. Cl. 29—527.1 **4 Claims**



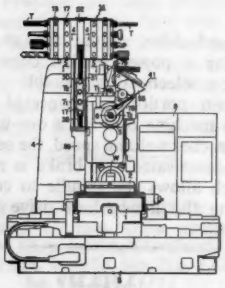
The method and apparatus of this invention provide for so engaging a sidewall of metal shell with a die member as to prevent radial shifting of the shell and to prevent distortion of an outer cylindrical wall thereof while an annular rubber sealing element is being molded to the inner margin of said sidewall.

3,613,224
MACHINE TOOL
Robert F. Newton and Tibor J. Csapo, Worcester, Mass., assignors to The Heald Machine Company, Worcester, Mass.
Filed Mar. 26, 1969, Ser. No. 810,626
Int. Cl. B23q *3/157*
U.S. Cl. 29—568 **5 Claims**



This invention relates to a machine tool having an automatic tool-changing capability and, more specifically, to such an apparatus wherein the tools are stored in a rotatable magazine and transported to a driven spindle by an arm.

3,613,225
TOOL CHANGER FOR MACHINE TOOL
Yoshikazu Sato, 1026, 4-chome, Shimotakaido, Suginami-ku, Tokyo, Japan, and Susumu Ogasawara, 57 Hatsuegaoka, Hodogaya-ku, Yokohama-shi, Kanagawa-ken, Japan
Filed June 12, 1969, Ser. No. 832,764
Claims priority, application Japan, June 18, 1968, 43/41,641
Int. Cl. B23q *3/157*
U.S. Cl. 29—568 **4 Claims**



A tool changer for changing tools in a machine tool in accordance with a preselected schedule. A body comprising a pair of converging ways is oscillated by a data controlled servo motor between a pair of positions. In the first position an arm carried by one of the ways grasps a selected tool from storage and lifts it away from the

storage position. In the second position the tool is inserted in the tool spindle for operating on a work piece. An arm carried by the other of the ways removes the tool from the spindle when the work operation is completed and returns it to storage. Synchronized fluid motors are used to operate the movement of the arms.

3,613,226

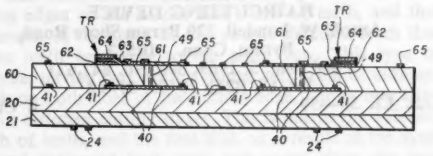
THREE-DIMENSIONAL INTEGRATED CIRCUITS AND METHODS OF MAKING SAME

Robert W. Haisty, Richardson, and Rowland E. Johnson and Edward W. Mehal, Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Original application Aug. 18, 1964, Ser. No. 390,298. Divided and this application Jan. 27, 1969, Ser. No. 836,675

Int. Cl. B01j *17/00*; H01l *1/16*

U.S. Cl. 29—577 12 Claims



Disclosed are methods for forming a plurality of integrated circuits in three dimensions within a single body of monocrystalline material. The method includes forming a plurality of circuit function-performing regions located respectively in separate spaced apart levels of a monocrystalline body. Regions of the respective layers are then electrically interconnected by conductive means extending through the body of monocrystalline material.

3,613,227

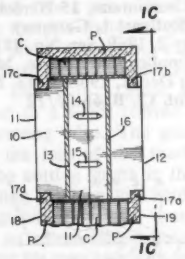
METHOD OF MAKING STATOR ASSEMBLIES FOR AXIAL AIRGAP MACHINES

Louis W. Parker, 2408 Sunrise Key Blvd., Fort Lauderdale, Fla. 33304

Continuation-in-part of application Ser. No. 699,196, Jan. 19, 1968. This application Dec. 12, 1969, Ser. No. 884,401

Int. Cl. H02k *15/00*

U.S. Cl. 29—596 8 Claims



An axial airgap machine stator is fabricated by sequentially positioning halved laminated blocks between casting pressure plates, each such block, when completed, consisting of a comparatively narrow central laminated portion integral with comparatively wider end lamination portions. Preformed stator coils are positioned between the halved blocks in staggered relation to one another in an arrangement providing a plurality of radially extending voids. The voids are blocked by plugs whereafter plastic material is poured into the casting plates, and cured. The plastic material, during subsequent cooling, contracts to secure the halved blocks forceably together adjacent said stator coils. After the cooling step, the blocking plugs are removed from the assembly to leave radial voids between the assembled stator coils and lamination blocks.

3,613,228

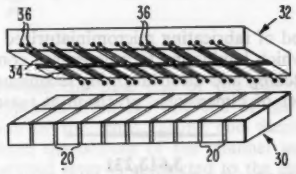
MANUFACTURE OF MULTIELEMENT MAGNETIC HEAD ASSEMBLIES

Miles H. Cook, Walter Nystrom, Duane R. Secrist, and Harold L. Turk, San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed July 2, 1969, Ser. No. 838,545

Int. Cl. H01f *7/06*

U.S. Cl. 29—603 5 Claims



In the process of batch fabrication of multigap magnetic head assemblies, such as used in fixed head storage files, a nonmagnetic support structure is bonded to a magnetic ferrite body to facilitate grinding and polishing of the ferrite to desired dimensions, which represent track width and spacing, and gap length and throat height, inter alia. Conductors or wires are disposed in grooved portions of a magnetic ferrite back structure for electromagnetic coupling with the transducing gaps disposed in the front structure. Bonding glasses having three different flow temperatures are employed for joining the parts of the assembly, and the coefficients of thermal expansion of the several parts match within a narrow range.

3,613,229

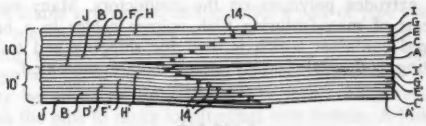
METHOD OF MAKING TRANSFORMER CORES

Willy Olsen, Mount Vernon, Ill., John B. McKee, Glendale. Mo., and William M. Pahel, Salem, Ill.; said Olsen and said Pahel assignors to Olsen Magnetic, Inc., Mount Vernon, Ill., and said McKee assignor to Wagner Electric Corporation, Newark, N.J.

Filed Dec. 31, 1969, Ser. No. 889,512

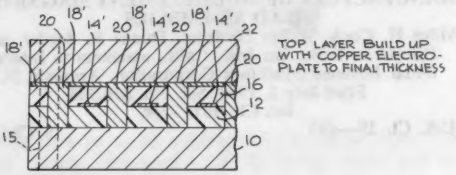
Int. Cl. H01f *7/06*

U.S. Cl. 29—605 10 Claims



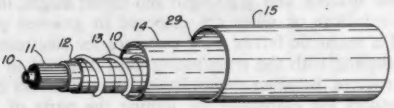
An improved method of making transformer cores comprises winding a plurality of turns of grain-oriented magnetic material, cutting the turns along a radial line extending perpendicular to the turns, arranging the resulting laminations in groups comprising adjacent laminations such that the laminations in each group increase in length from the innermost to outermost lamination, relocating at least one lamination of each group to another position in that group wherein it lies between two shorter laminations, tightly nesting the various groups with one another and joining the ends of all laminations to form a closed core wherein the ends of all but the relocated laminations form butt joints and wherein the ends of said relocated laminations form overlapped joints.

3,613,230
METHOD OF FABRICATING COAXIAL CIRCUITRY
William Griff, Tarzana, Calif., assignor to The Bunker-Ramo Corporation, Oak Brook, Ill.
Filed Apr. 29, 1969, Ser. No. 820,108
Int. Cl. B41m *3/08*; H05k *3/00*
U.S. Cl. 29—624 R **8 Claims**



A method of fabricating microminiaturized coaxial circuitry in which laminating techniques are combined with selective etching and electroforming techniques to obtain a high order of dimensional precision at reasonable cost.

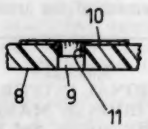
3,613,231
METHOD FOR MANUFACTURING HIGH VOLTAGE CABLE SYSTEMS
Paul F. Pugh, 4082 Sequoyah Road, Oakland, Calif. 94605
Filed July 25, 1969, Ser. No. 844,954
Int. Cl. H01b *13/00*; H05k *3/00*
U.S. Cl. 29—624 **15 Claims**



Preassembled high voltage cable system operated with oil and water circulation incorporating forced cooling permits lower cost underground cable work. A unique method of manufacturing preassembled high voltage cables facilitates ease of forced cooling and monitoring the temperature and quality of high voltage cable. Pressurized fluid aids electrical and mechanical performance of cable during manufacturing, installation, and while in operation. Heat is extracted by a unique method. Ageing of cable is determined by an electronic circuit. Existing overhead bare and insulated lines can be placed directly underground and quickly. Splices and terminations are sealed by fluid pressure. New fluid-filled and pressurized high voltage cables have centering material and extruded polymers on the conductors. Many novel aspects of manufacturing high voltage cables in a box-shaped container which is used for shipping and transporting potheads—factory attached—are presented.

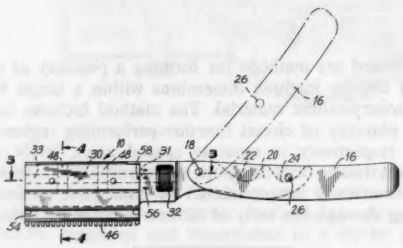
3,613,232
MANUFACTURE OF CIRCUIT BOARDS
George W. Edwards, 6–10 Harp St., Campsie, New South Wales, Australia
Filed July 1, 1969, Ser. No. 838,095
Claims priority, application Australia, July 12, 1968, 40,591/68
Int. Cl. B41m *3/08*; H05k *3/00*
U.S. Cl. 29—625 **2 Claims**

A circuit board, in which circuits are formed on a dielectric substrate member by a layer of conductive material bonded to one side of the substrate member, or by two layers of conductive material bonded one to each side of the substrate member, is manufactured by the following steps: forming holes in desired positions through the substrate member to form terminal points of a desired circuit layout; bonding the layer or layers of conductive material to the substrate member and over the holes; printing and etching the circuit; and drawing that part of



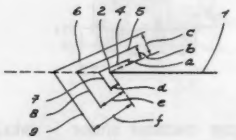
the layer or layers over the holes into the holes in a mechanical operation to form a conductive wall or walls in each of the holes.

3,613,233
HAIRCUTTING DEVICE
Arnold W. Lundell, 220 Byram Shore Road, Byram, Conn. 10573
Filed Aug. 5, 1969, Ser. No. 847,621
Int. Cl. B26b *19/00, 21/12*
U.S. Cl. 30—30 **6 Claims**



A device for cutting hair having finger manipulating means for adjusting the depth of cut of the hair. The adjusting means may be operated without ceasing the haircutting operation, and the elongated handle of the device may be pivoted out of the way if it is desired to use the formed finger rest.

3,613,234
HAIR CUTTING MACHINE
Wilhelm Gumbmann, 15 Herbsthalde, 7 Stuttgart 1, Germany
Filed May 2, 1969, Ser. No. 821,315
Claims priority, application Austria, May 10, 1968, A 4,529/68; Dec. 2, 1968, P 18 12 214.0
Int. Cl. B26b *21/12*
U.S. Cl. 30—31 **7 Claims**



A hair cutting machine with at least one cutting blade between two plates having rows of teeth in parallel with the cutting edge of the blade. The plates comprise flat or slightly concave guide surfaces having different perpendicular distances from the cutting edge.

Previous hair cutting machines with interchangeable blades supported between two plates comprise base plates having double combs with a handle designed to support

these blades. Cover plates are attached to the base plates and the blades are held between both. Both base plate and cover plate have rows of teeth running parallel with the cutting edges of the blades. The outer surfaces of the plates have convex curvature normal to the cutting edges of the blades; this convex curvature passes over to the curvature of the external edges of the teeth. This type of hair clipper has also been designed with one of its sides forming a cutting comb and the other a normal comb. With this type of hair clipper it is possible to change the cutting length of the hair, but there is no possibility to make exact adjustments because the setting angle of the machine cannot exactly be determined on its head.

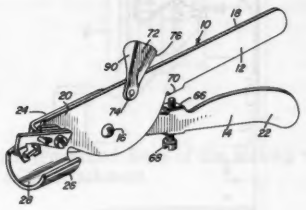
New types of hair cutting machines, equipped with razor blades which are held between plates, permit a considerable improvement in graduation of cutting stages without mechanical alterations of the machine. This is due to the fact that both plates have almost the same size, that each side of the two plates parallel with the cutting edges of the blades has a row of teeth, and that the length of the teeth of one row is different from that of the teeth belonging to the other row. This type of machine, having two cutting combs with teeth of different length on both sides of the cutting edge, allows operating in four different cutting stages. This is due to the different length of teeth, and the fact that, as a result of the symmetrical design of both base and cover plate, the machine can be used in every cutting position. Hair cutting machines of this type have also been used in versions having more than two cutting combs, i.e., more than two operative cutting edges of the blades.

The cutting length of the hair, obtained with this type of hair cutting machine, depends on the distance in which the cutting edge of the blade is passed through the hair above the skin of the head. Moreover, the thinning-out effect depends on the cutting angle, i.e., the angle formed by the direction of the guide motion of the blade and the plane of the blade. The hair cutting and thinning-out instruments described above have teeth, the external edges of which more or less have convex curvature, making it possible to change to a certain extent the length of the hair-cut by varying the cutting angle. These continuous graduations in a hair-cut's length, however, cannot exactly be determined during the cutting operation, thus requiring considerable skill to make possible a perfect haircut when using these generally known machines. In particular, it is difficult to carry out a correct transition cut from the back-hair to the hair of the head.

Other hair cutting machines have interchangeable blades supported between two plates, one of which has a row of teeth on the side that runs parallel with one cutting edge of the blade, the cutting edge itself being overlapped by the teeth. The external edges of these teeth lie partially or totally in a guide surface which runs parallel, plain or in a slight convex curvature with the corresponding cutting edge. The guide surface sets off clearly against the rest of the machine's surface. For adjustment of the cutting length in this type of generally known hair cutting machine, the blade in any case must be displaced against the teeth, thus complicating hair cutting to such an extent that it becomes impossible for an amateur to cut his own hair with good results.

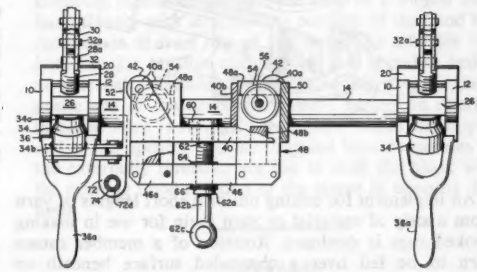
3,613,235
CABLE RIPPER
Thomas C. McCormick, Eugene, Oreg., assignor of a fractional part interest to John P. Neufeld, Eugene, Oreg.
Filed May 15, 1970, Ser. No. 37,673
Int. Cl. B21f *13/00*
U.S. Cl. 30—91.1 **6 Claims**

A pair of first and second crossed and pivotally connected levers including rear handle ends and front jaw ends. The jaw end of the first lever defines a channel extending longitudinally along one side thereof and opening toward the other jaw end and includes a longitudinally extending cutting lever having a rear base end and a front cutting end. The channel opens toward the



cutting lever and the base end of the cutting lever is pivotally supported from the jaw end of the first lever for oscillation of the front cutting end thereof toward and away from the bottom of the channel and the jaw end of the second lever is connected to the cutting lever forward of its axis of oscillation.

3,613,236
AXIAL PIPE CUTTER
William A. Lauck, Elyria, Ohio, assignor to Emerson Electric Co., St. Louis, Mo.
Filed May 16, 1969, Ser. No. 825,152
Int. Cl. B23d *21/02, 21/08*
U.S. Cl. 30—92.5 **10 Claims**

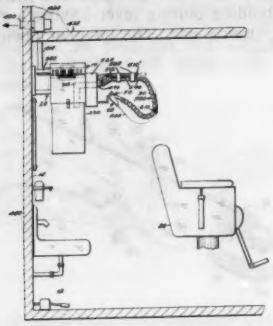


A frame is provided and includes a pair of pipe clamping means with a pair of ways extending between the clamp means. A carriage is reciprocably mounted on the ways and carries one or more pipe cutting wheels which may be advanced by screw means into cutting relation with the pipe to make longitudinal cuts therein. A linkage is connected between the frame and carriage, operated by a handle, for reciprocating the carriage and the pipe cutting means longitudinally of the pipe.

3,613,237
VACUUM ASSEMBLY FOR HAIR CLIPPER
Thomas P. Keane, 14 Euclid Ave., Council Bluffs, Iowa 51501
Filed Feb. 18, 1970, Ser. No. 12,287
Int. Cl. B26b *19/44*
U.S. Cl. 30—133 **11 Claims**

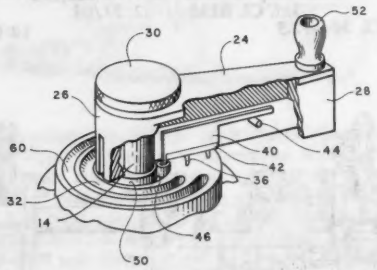
A vacuum assembly for a hair clipper comprising a vacuum attachment fixed to the top of the clipper body and having its forward opening inclined with respect to

the blade assembly. A suction hose connecting to the vacuum attachment above the handle portion thereof.



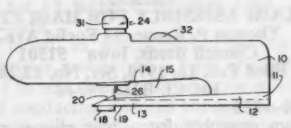
A cutting trap suction means comprising a motor disposed outside of the clipper room and clipper storage means.

3,613,238
ADJUSTABLE CUTTER FOR HOOKED RUG MATERIALS
Emery C. West, North Hollywood, Calif., assignor to Harold W. Smith and Elinore Churchin, fractional part interest to each
Filed June 26, 1970, Ser. No. 50,128
Int. Cl. B26b *27/00*
U.S. Cl. 30—136 **3 Claims**



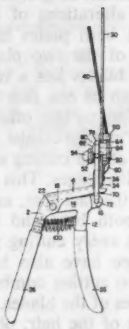
An implement for cutting uniform short lengths of yarn from a strip of material or yarn skein for use in making hooked rugs is disclosed. Rotation of a member causes yarn to be fed over a channeled surface beneath an oscillating blade in the rotating member and cut off at a predetermined point in each rotation. The length of the cut off pieces may be altered by insertion or removal of a collar at the hub of the rotating member.

3,613,239
CUTTER FOR FLOOR COVERING SUCH AS LINOLEUM AND THE LIKE
Leonard B. Porrelli, 716 Eau Claire Ave., Calgary 1, Alberta, Canada
Filed May 19, 1969, Ser. No. 825,492
Int. Cl. B26b *29/02*
U.S. Cl. 30—293 **4 Claims**



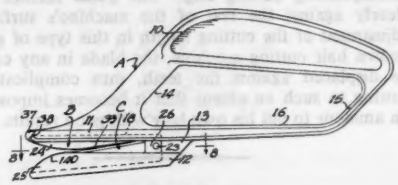
A linoleum cutter having a base plate with a guide on the underside engaging the edge of the adjacent linoleum. The edge to be cut overlies the base plate and a spring loaded cutter is forced through the overlying portion which is ramped upwardly by the base plate to facilitate the cutting action. The cutter is drawn along guides by the guide so that the cutter slices the linoleum whereby the two edges abut closely with one another.

3,613,240
SHEARS
Edward M. Wallace, Longmeadow, Mass., assignor to Wallace Mfg. Corp., Thompsonville, Conn.
Filed July 30, 1969, Ser. No. 846,055
Int. Cl. B26b *13/26*
U.S. Cl. 30—248 **3 Claims**



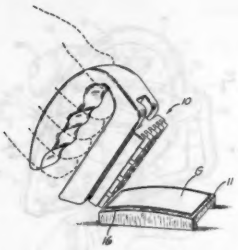
A shears or cutting device having a movable blade disposed in a horizontal plane vertically below the plane of the stationary blade, with the shears-closing movement being through a pulling force exerted, via a pull rod, on the movable blade to cause the movable blade to be rotated horizontally and vertically toward the stationary blade into a positive cutting engagement with the cutting edge of the stationary blade, the means for achieving the pulling force being pivotally interengaged with the movable blade at a point in spaced relationship with and vertically upwardly of the general plane of the movable blade.

3,613,241
CUTTER FOR SOFT FIBROUS MATERIALS
Derek R. Allen, Montrose, Calif., assignor to Allen Medical Instruments Division of Bio-Dynamics Inc., Montrose, Calif.
Filed Sept. 22, 1969, Ser. No. 859,920
Int. Cl. B26b *29/00*
U.S. Cl. 30—294 **9 Claims**



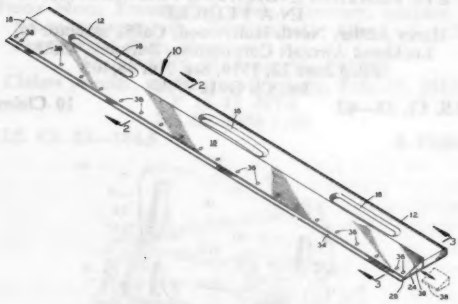
A knife for cutting surgical bandages, paper and the like, comprising a blade and an opposed feeding jaw cooperatively defining a material-receiving narrow gap in which the blade's cutting edge substantially intersects the supporting face of the jaw at a small angle in the range of 0°–10° and in which the material is severed as it is pushed through the gap.

3,613,242
SKIN GRAFT CUTTER
Charles C. Hill, Ann Arbor, and Frank Romberger, Ferndale, Mich., assignors to Michigan Research Corporation, Ann Arbor, Mich.
Filed Dec. 29, 1966, Ser. No. 605,796
Int. Cl. B26b *3/04*
U.S. Cl. 30—305 1 Claim



A skin graft cutter comprising a body which supports a plurality of cutting blades defining longitudinally and transversely spaced cutting edges. A block is provided with a curved surface which supports the skin graft in position for progressive engagement with the cutting edges.

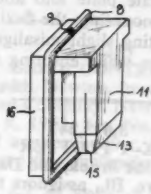
3,613,243
CUTTING ROD
Jesse Wade Baker, 122 Glen Parkway, Hollywood, Fla. 33021
Filed Nov. 10, 1969, Ser. No. 875,318
Int. Cl. E01c *19/12*
U.S. Cl. 30—314 3 Claims



A cutting rod which includes an elongated handle, an elongated hollow metal member attached to the handle and an elongated metal blade attached to the metal member.

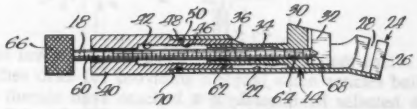
3,613,244
SLIDE BOLT
Albert Flecher, 35 Rue Herder, F–67, Strasbourg, France
Filed Sept. 15, 1969, Ser. No. 858,084
Claims priority, application France, Sept. 17, 1968, 9,270; Sept. 3, 1969 6931254
Int. Cl. A61c *13/22*
U.S. Cl. 32—5 4 Claims

Semi-automatic locking means for artificial dentures part of which is readily removable and part of which can only be removed by a dental surgeon, comprising a male element with means for guiding it when mounting it and for ensuring vertical stability, and a female element provided with centering and locking means, and a resilient element for keeping the male and female elements assembled.



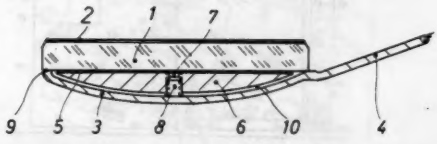
A slightly modified form of the locking means can be utilised as an attachment.

3,613,245
MATRIX RETAINER
Sigmund P. Knight, 535 N. Michigan Ave., Chicago, Ill. 60611
Filed Nov. 3, 1969, Ser. No. 873,533
Int. Cl. A61c *5/12*
U.S. Cl. 32—63 7 Claims



A dental matrix retainer for clamping a matrix band around a tooth. The retainer includes an elongated member having slots defined on one end thereof and slidably supporting a block within an opening. The block has clamping means for locking the ends of a looped matrix band therein with intermediate portions of the band being received in at least one of the slots. The movable block has a major portion enclosed by said member and has an externally threaded portion extending towards the opposite end of the opening. A sleeve having an internally threaded bore is rotatably supported within the opposite end of the opening and the threaded bore cooperates with the externally threaded portion to shift the block within the opening upon rotation of the sleeve in opposite directions.

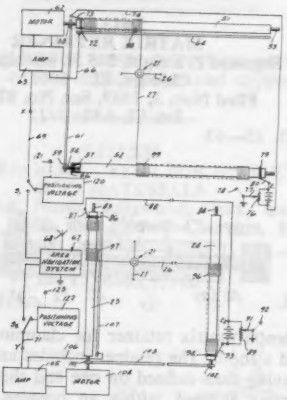
3,613,246
MOUTH MIRROR
Eduard Zdarsky, 6 Oberfohringer Strasse, Munich, Germany
Original application May 3, 1966, Ser. No. 547,330. Divided and this application Sept. 30, 1969, Ser. No. 871,108
Int. Cl. A61c *3/00*
U.S. Cl. 32—69 7 Claims



A dental mirror is composed of a mirror body, a flexible intermediate plate and a mounting plate, all three elements being of approximately the same diameter; the intermediate plate and mirror body being bonded to each other only at their peripheries, while the intermediate

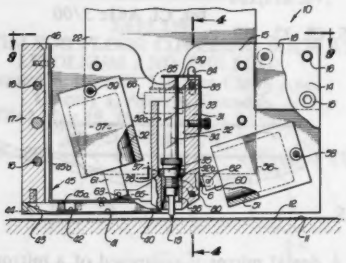
plate is secured to the mounting plate by means of a central connecting means which exerts force to pull the rim of the intermediate plate into abutting engagement with the rim of the mounting; the flexibility of the intermediate plate permitting slight misalignment of the central connecting means while ensuring a close fit around the periphery.

3,613,247
X–Y PLOTTER
Earl Stuart Perkins, Oak Brook, and Daniel A. Wierzbowski, Downers Grove, Ill., assignors to Butler National Corporation, Oak Brook, Ill.
Filed Aug. 22, 1969, Ser. No. 852,403
Int. Cl. B43l 5/00
U.S. Cl. 33—1 M **13 Claims**



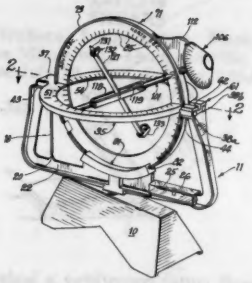
An X–Y plotter for use with an area navigation system, for example, which utilizes resistance wire wound about and extending between spaced rollers which are driven to position an indicator block mounted on the wire between the rollers. An indicator is rotatably mounted on the block and has a portion which frictionally engages a transparent layer to indicate the most recent direction of movement of the indicator.

3,613,248
DRAFTING MACHINE PEN CONDITIONER
Andrew M. McInnis, Covina, Calif., assignor to California Computer Products, Inc., Anaheim, Calif.
Filed Aug. 27, 1969, Ser. No. 853,342
Int. Cl. B43l 13/00
U.S. Cl. 33—18 R **15 Claims**



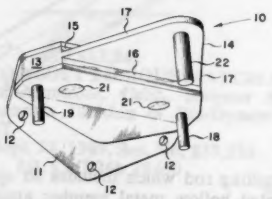
The invention concerns apparatus for lifting and lowering a pen in an automatic drafting machine, and wherein the pen tip is conditioned during storage in retracted position.

3,613,249
DEVICE FOR LOCATING HEAVENLY BODIES
Arthur Edward Evenson, 3606 Pheasant Drive, Rolling Meadows, Ill. 60008
Filed Nov. 18, 1968, Ser. No. 777,214
Int. Cl. G01c 17/34
U.S. Cl. 33—61 **6 Claims**



A device for locating a heavenly body by knowing its azimuth and declination with respect to the celestial sphere or, having a specific body, reversing the process and determining the azimuth and declination. The device includes sighting means mounted for movement in azimuth and declination, a horizon (azimuth) ring and declination ring, both marked in degrees, means for establishing a horizontal plane of reference and means to take into account the time of observation. The device is characterized by simplicity of construction in order to adapt the same for use by youthful or amateur astronomers.

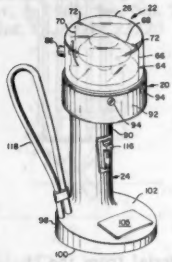
3,613,250
EYE POSITION INDICATOR FOR MOUNTING IN A VEHICLE
Harry Antler, North Hollywood, Calif., assignor to Lockheed Aircraft Corporation, Burbank, Calif.
Filed June 22, 1970, Ser. No. 48,403
Int. Cl. G01c 1/00
U.S. Cl. 33—63 **10 Claims**



This disclosure involves an eye position determining device and indicator for mounting within view of the operator on the centerline of a vehicle.

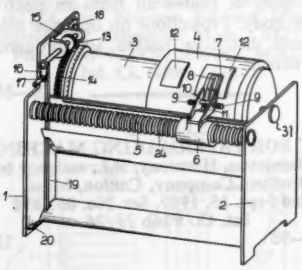
It employs a body of light-conducting material with an internal light source and localized light-emitting and light-blocking regions so arranged that a pre-determined image, for example, a pair of horizontal parallel lines and a halo of light around a vertical rod are observed by the operator only when his head and eyes are in the correct position for precise maneuvering of the vehicle. It employs a planar light-blocking member restricting vision of the operator in view of the indicator so that he can view the parallel lines only when his eyes are at the required vertical distance above a pre-determined reference in the vehicle. The indicator includes a source of light and a light interrupter, so arranged that the light source is visible at all times unless the observer's eyes are at the correct angular displacement relative to the indicator.

3,613,251
HAND HELD BEARING COMPASS
Richard Fitzpatrick and Richard D. Fitzpatrick, Wethersfield, and William Balch, Bolton, Conn., assignors to Quint Machine Corporation, Manchester, Conn.
Filed Apr. 2, 1969, Ser. No. 812,681
Int. Cl. G01c *17/10*
U.S. Cl. 33—72 3 Claims



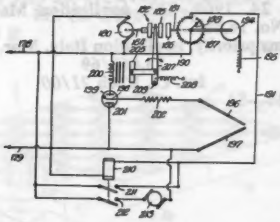
A magnetic compass, specially adapted to be held by hand, includes a transparent compass bowl housing a transparent compass card. A lubber line and a pair of sights on the bowl enable the compass to be used for taking bearings of distant objects for navigational purposes. Attached to the bottom of the bowl is a base including a generally cylindrical vertical hand grip. This grip also serves as a housing for batteries for energizing a lamp used to illuminate the bowl and card for nighttime use. There is a wrist strap fixed to the base.

3,613,252
APPARATUS FOR ALIGNING PRINTING FORMS
Franz Moos, Frankenthal, Pfalz, Germany, assignor to Schnellpressenfabrik Frankenthal, Albert & Cie, Frankenthal, Pfalz, Germany
Filed Feb. 10, 1969, Ser. No. 797,798
Claims priority, application Germany, Feb. 27, 1968, P 16 11 387.4
Int. Cl. B41b *1/00*
U.S. Cl. 33—184.5 6 Claims



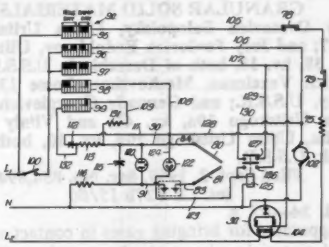
A method and apparatus for mounting printing forms and the like onto a separate form mounting device for application to form cylinders and form saddles of printing form carriers consisting of mounting the color matter of the transparent print onto a transparent foil having a fixed measurement cross hair and aligning this foil with its corresponding printing form so that the combination can be mounted onto a printing form carrier. The apparatus is provided with a guide rail means which is mounted parallel with respect to printing form carrier and a pivotable arm which is mounted on the guide rail means for step-by-step movement so that the transparent print which is mounted on its transparent foil can be aligned onto the printing form carrier.

3,613,253
DRIER CONTROL
Thomas R. Smith, Newton, Iowa, assignor to The Maytag Company, Newton, Iowa
Application Dec. 9, 1963, Ser. No. 329,155, which is a continuation of application Ser. No. 22,323, Apr. 14, 1960. Divided and this application Nov. 30, 1970, Ser. No. 93,732
Int. Cl. F26b *13/10*
U.S. Cl. 34—45 13 Claims



This invention is directed to a control system useful in a clothes drier for providing a signal when articles being dried therein have reached a predetermined selected degree of dryness. Electrodes are positioned for contact with and completion of an electrical circuit through the articles being dried. Means connected to the electrodes are responsive to the electrical resistance of random samples of the articles to effectively sense the moisture content thereof and to produce a control signal at a selected article dryness condition. In one embodiment, motor-driven spring-biased storage means gradually accumulate potential energy as the sensing means indicates an increasing dryness condition and at a preselected degree of dryness effectively produces said control signal.

3,613,254
DRIER CONTROL
Thomas R. Smith, 710 W. 11th St. S., Newton, Iowa 50208
Continuation of application Ser. No. 22,323, Apr. 14, 1960. This application Dec. 9, 1963, Ser. No. 329,155
Int. Cl. F26b *13/10*
U.S. Cl. 34—45 13 Claims



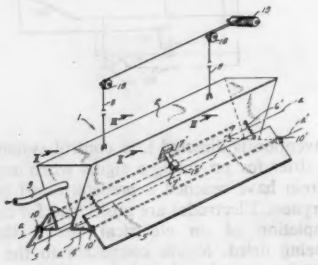
This invention is directed to a control system, useful in a clothes drier, for providing a signal when articles have reached a preselected degree of dryness. Electrodes are positioned for contact with, and completing an electrical circuit through, the articles being dried. A capacitor

connected in circuit with the electrodes is charged with a DC voltage. A circuit is provided for discharging the capacitor. The relative rates of charge and discharge of the capacitor varies with the electrical resistance of the articles which changes with the moisture content. A control signal is provided when the capacitor reaches a predetermined charge. An adjustable preselection device varies the relative rates of charge and discharge of the capacitor so that the control signal will be produced when the articles attain a preselected degree of dryness.

3,613,255
VEHICULAR DRYING APPARATUS

Uberto Capra, Vicenza, Italy, assignor to Ceccato & Co. S.p.A., Alte Ceccato, Vicenza, Italy

Continuation-in-part of application Ser. No. 860,663, Sept. 24, 1969. This application Mar. 3, 1970, Ser. No. 16,067
Claims priority, application Italy, Mar. 5, 1969, 13,660/69
Int. Cl. F26b *21/00*
U.S. Cl. 34—54 **10 Claims**



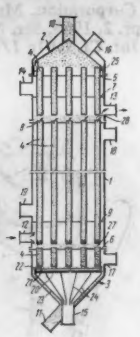
A frame, movable with reference to a vehicle to be dried, carries an elongate nozzle at right angles to the path of relative motion, the nozzle having a slot trained upon a vehicular surface and flanked by a pair of mobile flaps controlling a switch for reversing the operation of a motor normally tending to move the nozzle toward the vehicle. Reversal of this motion occurs when a flap touches a vehicular surface or when air emitted by the nozzle slot is reflected by the vehicle toward the flaps with a sufficient force to indicate an overly close approach of the nozzle toward the surface to be dried.

3,613,256
APPARATUS FOR CONTACTING GASES WITH GRANULAR SOLID MATERIALS

Anatoly Ovseevich Belopolsky, Ulitsa Uritskogo 10a, kv. 37; and Jury Pavlovich Evdokimov, Ulitsa Griboedova 38, kv. 18, both of Dzerzhinsk, U.S.S.R.; Garald Lvovich Vexelman, Moskovskoe shosse 139, kv. 37, Gorky, U.S.S.R.; and Gennady Georgievich Nikolsky, Ulitsa Uritskogo 10a, kv. 41; and Vitaly Pavlovich Pchelin, Ulitsa Uritskogo 10a, kv. 10, both of Dzerzhinsk, U.S.S.R.

Filed Sept. 2, 1969, Ser. No. 854,694
Int. Cl. F27b *15/00*
U.S. Cl. 34—57 A **3 Claims**

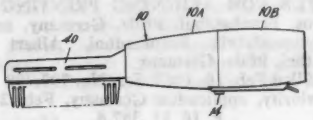
An apparatus for bringing gases in contact with granular solid materials, wherein in the granular solid material charging and discharging chambers there are provided means for allowing a granular solid material fluidizing agent to flow through them, thereby making it possible to attain uniform distribution of solid material particles and to ensure uniform discharge of the granular solid material from the apparatus. The charging chamber accommodates a cone-shaped baffle whose apex faces a connection provided for the charging of a granular solid material into the chamber. The baffle directs the stream of granular solid material from the charging connection to the peripheral zone of the charging connection to the peripheral zone of the charging chamber.



3,613,257
HAIR DRYER

Chikao Yoshiike, 191, 6-chome, Gotanda, Shinagawa-ku; Hideyuki Tsuru, 7, Shimbori-cho, Azabu, Minato-ku; and Yoichi Yoshiike, 191, 6-chome, Gotanda, Shinagawa-ku, all of Tokyo, Japan

Original application Apr. 4, 1966, Ser. No. 539,682. Divided and this application Mar. 3, 1969, Ser. No. 823,224
Int. Cl. A45d *20/48*
U.S. Cl. 34—91 **4 Claims**

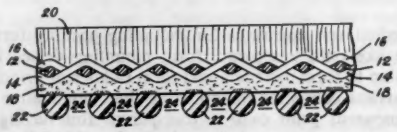


A hair dryer having a cylindrical two-part main body, a holder for a comb or a brush connected to the body and receiving a supply of heated air from an electric heater located in the body. Projections on opposite sides of the comb or brush distribute heated air throughout their longitudinal extent.

3,613,258
FELT FOR PAPERMAKING MACHINE

Thomas A. Jamieson, Harmony, R.I., assignor to Draper Brothers Company, Canton, Mass.

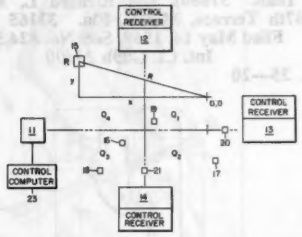
Filed Sept. 15, 1969, Ser. No. 857,890
Int. Cl. F26b *13/26*
U.S. Cl. 34—95 **12 Claims**



A felt for use in a papermaking machine including an endless belt on the back side of which a plurality of monofilaments are adhered in spaced relation, the monofilaments defining water-conveying channels into which

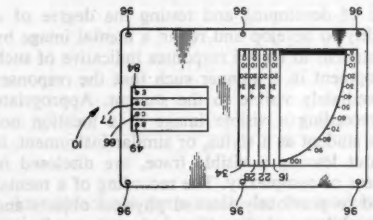
water expressed from a paper sheet located on the face of the belt is directed when the endless belt and the paper sheet are moved through a press section of the paper-making machine.

3,613,259
SIMULATION DEVICE
Thomas W. McCurnin and Lloyd J. Perper, Tucson, Ariz., assignors to the United States of America as represented by the Secretary of the Navy
Filed Nov. 5, 1968, Ser. No. 773,451
Int. Cl. G09b *23/20*
U.S. Cl. 35—1 **5 Claims**



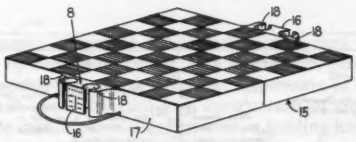
A simulation system including a control device, a master transmitter, a plurality of slave transmitters and a plurality of receivers. The master and slave transmitters are physically spaced apart and their transmission signals form a hyperbolic grid netword. The receivers are positioned within the hyperbolic grid network and process the signals from the master and slave transmitters to simulate dose and dose rate of a simulated detonation that takes place in the hyperbolic grid network. The master and slave transmitters operate at different modulation frequencies to identify receiver quadrants and to provide desired resolution. The receivers are controlled by control signals from the master transmitter to compare and remember the phase difference between oppositely positioned transmitters for determining position and dose at each receiver within the hyperbolic grid.

3,613,260
CONFIDENCE TESTING DEVICE
Emir H. Shuford, Jr., 4 Lincoln Terrace, Lexington, Mass. 02173, and Herman Edward Massengill, Jr., 107 Hemlock St., Arlington, Mass. 02174
Filed May 4, 1970, Ser. No. 34,422
Int. Cl. G09b *1/28*
U.S. Cl. 35—8 R **7 Claims**



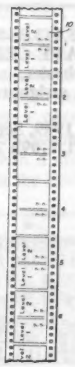
A device for answering multiple choice test questions having a plurality of superimposed, laterally slidable plates interposed between fixed top and bottom plates. Each of the slidable plates and the bottom plate is provided with a bar representing confidence level and a graduated curve representing the score associated with the confidence level. The top plate is formed with an opening which allows viewing of the bar and graduated scale on each of the underlying plates. The length of exposed bar on each of the plates represents the degree of confidence in each of several possible answers, the exposed length being specified by the position of an overlying plate with respect to the adjacent underlying plate. The score associated with the degree of confidence is presented on the graduated curve of an underlying plate at the intersection of the edge of the adjacent overlying plate and the graduated curve on the underlying plate.

3,613,261
CHESS PLAYING AID
Eligia J. Petty, % John H. Petty, Stella Rte., Paxton, Fla. 32205
Filed May 29, 1969, Ser. No. 828,853
Int. Cl. G09b *19/22*
U.S. Cl. 35—8 R **3 Claims**



This invention consists of a chess board of predetermined thickness that is made of two pieces of material of equal size that are hinged together to form a single surface on which the game of chess is played. The chess board is provided with two diametrically opposed chip holders that are integrally formed with the ends of the board and project outward from the ends. A plurality of chips, each chip having the basic configuration of a disk, are placed in the chip holder when not in actual use. Indicia are located on each side of the chips for the playing of the chess game, as noted later on in this specification.

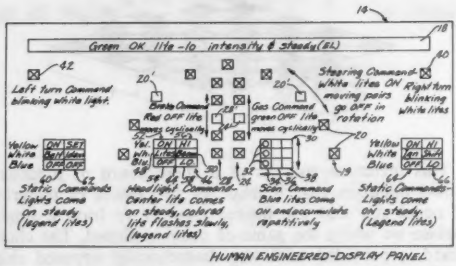
3,613,262
COINCIDENT DISPLAY ARRANGEMENT AND PRESENTATION OF DIFFICULTY DIFFERENTIATED PROGRAMMED INSTRUCTION
Hubert C. Feder, 1517 Roosevelt Ave., Alamogordo, N. Mex. 88310
Filed June 30, 1969, Ser. No. 837,773
Int. Cl. G09b *1/16*
U.S. Cl. 35—8 R **1 Claim**



The arrangement of instructional material in educational texts, films, filmstrips or other similar means of communication for teaching groups of learners in which

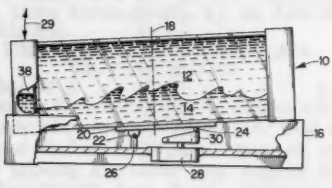
individual learners are distinguished by different learning ability with the communication means being divided into composite learning frames having a plurality of sectors, each sector containing subject matter material presented on different levels of difficulty of the learning goal and each level of difficulty offering multiple questions to support simultaneously learning toward different learning goals in the same time period by learners of different ability levels.

3,613,263
PERIPHERAL VISION DISPLAY PANEL FOR AUTOMOBILE DRIVER TRAINERS
Donald H. Schuster, Ames, Iowa, assignor to Iowa State University Research Foundation, Ames, Iowa
Continuation-in-part of application Ser. No. 655,045, July 21, 1967, now Patent No. 3,523,374, dated Aug. 11, 1970. This application June 19, 1969, Ser. No. 834,794
Int. Cl. G09b *9/04*
U.S. Cl. 35—11 **9 Claims**


Green OK lite - lo intensity & steady (EL)
Left turn Command blinking white light
Steering Command: White lites ON moving pairs go OFF in rotation
Right turn blinking white lites
Static Commands Lights come on steady (legend lites)
Headlight Command: Center lite comes on steady, colored lite flashes slowly, (legend lites)
Scan Command Blue lites come ON and accumulate repetitively
Static Commands: Lights come on steady, (Legend lites)
HUMAN ENGINEERED-DISPLAY PANEL

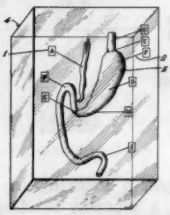
A device used with automobile driver trainers including a display panel mounted just below the driver's view as he watches the driver training film on a projection screen. The driver's responses to the driver training film are compared with film commands and the errors are converted to corrective commands expressed by the display panel directing the driver through his peripheral vision to take specific corrective action. The magnitude of the corrective action required is indicated by the speed of the cyclical repetition of the corrective commands. The signalling lights on the display panel issuing the corrective commands are situated in their relationship corresponding to the operative controls of the driver trainer unit. Upon the giving of proper responses to the situations presented on the screen the display panel will signal no corrective action is required of the student driver.

3,613,264
WAVE CELL
Joseph A. Vitka, Winchester, and James D. Murphy, Framingham, Mass., assignors to Motionetics, Inc., Endicott, N.Y.
Filed Oct. 23, 1969, Ser. No. 868,871
Int. Cl. G09b *23/12*
U.S. Cl. 35—19 R **7 Claims**



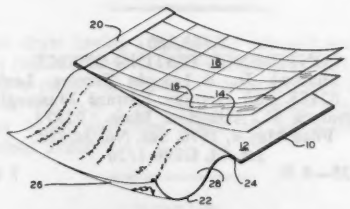
A wave cell, in which plural non-miscible liquids display fluidic wave motion, employs light mineral oil as a principal constituent of a first liquid and employs water as a principal constituent of a second liquid, with a minor portion of a fluorinated hydrocarbon in the first liquid and preferably with a minor portion of alcohol in the second liquid. The optional addition of a low-foaming surfactant enhances the displayed wave motions. An optically transparent acrylic resin tube closed with acrylic resin end caps forms the wave cell chamber, and an air trap at one end of the tube accommodates thermal expansion and contraction without unduly stressing the vessel.

3,613,265
PLASTIC EMBEDDED LABELED ARTICLES
Elliott Stern, Coral Gables, Fla. (704 Teasel Drive, Kingsport, Tenn. 37660), and Richard L. Aaron, 11340 SW. 47th Terrace, Miami, Fla. 33165
Filed May 14, 1969, Ser. No. 824,527
Int. Cl. G09b *23/00*
U.S. Cl. 35—20 **10 Claims**



Articles primarily for educational purposes are embedded in plastic together with labels and pointers or lead lines from the labels to specific regions or structures of the embedded article.

3,613,266
METHOD AND MEANS FOR ENHANCING MENTAL IMAGING CAPABILITIES
Malcolm J. Conway, Main Road, Gill, Mass.
Filed Mar. 24, 1969, Ser. No. 809,549
Int. Cl. G09b *19/00*
U.S. Cl. 35—22 R **7 Claims**

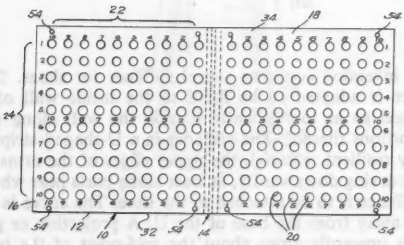


A method of developing and testing the degree of a student's ability to develop and retain a mental image by causing the student to record responses indicative of such image development in a manner such that the responses are not immediately visible to the student. Appropriate means for recording a visible image in a location not visible to the student as a stylus, or similar instrument, is moved without leaving a visible trace, are disclosed in various degrees of complexity. The recording of a mental image related to previously learned physical objects and relationships while precluding the student from directly viewing the progress or development of what he is recording improves the quality of the final recording as an indication of the complete mental picture which the student has developed. Additional inputs in the form of written, pictorial and/or audible material may be supplied to the student as the operation progresses to alter or modify the parameters, conditions, etc. which affect the mental image or responses developed therefrom.

3,613,267
TRANSPARENCIES TEACHING A METHOD INVOLVING MOVEMENT
Martin E. Levin, 30585 Birchway, Franklin Village, Mich. 48025
Filed Jan. 29, 1970, Ser. No. 6,824
Int. Cl. G09b *19/00*
U.S. Cl. 35—29 R 6 Claims

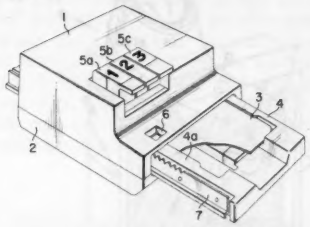
A device for teaching a method involving movement including a plurality of sheets sequentially movable into superposed relation. Each of the sheets includes a portion illustrating a representation of a person or an object in one different position of a plurality of different positions portraying a path of movement. At least one of the sheets includes a light permeable portion to facilitate the observation of the illustrating portion of a sub-adjacent sheet. When the successive sheets are in superposed relation, the progressive changes of the positions necessary to execute the entire movement may be simultaneously observed or if the sheets are separated and viewed individually any transitory position may be individually studied.

3,613,268
EDUCATIONAL GAME
Fred N. Fowler, 1140 E. Hillsdale B–209, Foster City, Calif. 94404
Filed Oct. 24, 1969, Ser. No. 869,058
Int. Cl. G09b *19/02*
U.S. Cl. 35—31 R 3 Claims



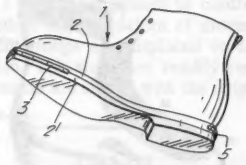
An educational game useful for the teaching of mathematical concepts and relationships comprising a playing board having a plurality of openings on its upper surface, pivot means secured to the undersurface of said board for balancing same, and pegs of varying predetermined weights insertable in any of the openings. The game involves introducing a problem by unbalancing the board with pegs inserted on one half. The problem is then solved by inserting pegs on the other side in positions which balance the board.

3,613,269
RESPONSE RECORDING DEVICE
Sakae Fujimoto, Tokyo, Japan, assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan
Filed Oct. 29, 1969, Ser. No. 872,014
Claims priority, application Japan, Nov. 4, 1968, 43/80,271
Int. Cl. G09b *1/02*
U.S. Cl. 35—48 B 5 Claims



A response recording device wherein a card to be punched by depression of one of a plurality of push buttons is slidably movable in a holder. Depression of a push button will mark the card and upon return of the push button the card is advanced. However, a holding lever will prevent return of the push button if it is only partially depressed, and this will prevent advancement of the card.

3,613,270
SOLE FOR A SKI BOOT
Nils Eie, Tennisveien 6, Oslo 3, Norway
Continuation of application Ser. No. 781,941, Dec. 6, 1968. This application May 28, 1970, Ser. No. 41,726
Int. Cl. A43b *13/12*
U.S. Cl. 36—2.5 AL 8 Claims

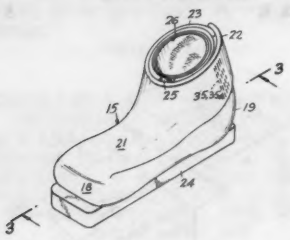


A ski boot comprises at least one solid and rigid element embedded between the insole and tread sole of the boot, the element being constituted of wear-resistant material such as metal or the like, with edge portions protruding beyond the contour of the sole to form contact surfaces with binding means on skis. The edge portions encircle the sole at the toe thereof and also extend at the heel. The rigid element may have a triangular incision at the heel for receiving a correspondingly shaped securing means. In one embodiment, the element is a one-piece plate of T-shape with a cross piece at the toe and a stem extending towards the heel.

3,613,271
RESHAPEABLE BOOT OR SHOE AND METHOD OF RESHAPING
S. David Geller, 431 Broadway, Lawrence, N.Y. 11559
Filed June 4, 1970, Ser. No. 43,376
Int. Cl. A43b
U.S. Cl. 36—2.5 AL 17 Claims

A boot or shoe for special use, such as orthopedic or sport use especially for skiing, is made of translucent thermoplastic material retaining its characteristics at very low temperatures but being soft and moldable when mildly

heated. To reshape the preformed molded boot to an individual's foot, the boot is heated until softened. When the foot, protected by a sock is inserted, the foot expands the tight areas. The loose areas are manually pressed inwardly until the boot fits comfortably, after which the reshaped boot is allowed to cool and set and the foot is removed. The apparent color of the boot is changed by changing the inner boot, sock or sock lining to one of the desired color. Interdigitating fastening means are molded on two overlapping wrap-around side straps extending from a front tongue which covers a front opening in the boot.



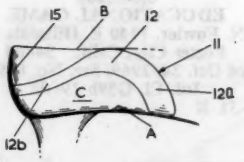
3,613,272
FOOTWEAR
Tatsuo Fukuoka, 3,3-Ban, 2-chome, Shin-Minami-Fukushima, Tokushima, Japan
Original application Oct. 24, 1968, Ser. No. 770,324, now Patent No. 3,552,039, dated Jan. 5, 1971. Divided and this application Aug. 31, 1970, Ser. No. 68,145
Int. Cl. A43b
U.S. Cl. 36—2.5 R **4 Claims**

Improved footwear is provided which includes an integrally formed sole and a foot cover member, each of the sole and foot cover member being integrally molded from synthetic thermoplastic resin material and having a foamed interior portion and a non-foamed exterior portion integral with and surrounding the foamed portion.

3,613,273
ANKLE SUPPORT
Richard T. Marquis, Rosemead, Calif., assignor of a fractional part interest to William J. Parker, San Gabriel, Calif.
Filed Mar. 2, 1970, Ser. No. 15,754
Int. Cl. A43b
U.S. Cl. 36—2.5 N **6 Claims**

A device for minimizing the possibility of excessive ankle strain, comprising an elastic member having an upper end connected to the outside of the wearer's leg above the ankle, and a lower end connected to the outside of the wearer's foot below the ankle. The relaxed length of the elastic member is no greater than the distance between its connections to the wearer's leg and foot when the wearer's foot is in its normal position, i.e., generally perpendicular to his leg, whereby the elastic member biases the outside of the wearer's foot upwardly whenever it is disposed below its normal position. This minimizes the possibility of rolling the outside of the foot under, and thus placing excessive strain on the ankle, particularly when landing after a leap. The lower end of the elastic member is preferably connected to the sole of a shoe adjacent the outer edge thereof. The upper end of the elastic member may be connected to an ankle strap, or to the top of a shoe extending above the wearer's ankle. The device includes inextensible means for limiting extension of the elastic member, thereby limiting the degree to which the outside of the wearer's foot can be turned under from its normal position.

3,613,274
HEEL STIFFENERS
Sally M. Willey, 44 Hampstead Lane, Highgate, London 6, England
Filed Nov. 6, 1969, Ser. No. 874,603
Int. Cl. A43b *13/42*
U.S. Cl. 36—68 **6 Claims**

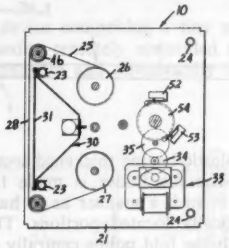


The invention concerns a heel stiffener for shoes. The stiffener is adapted to be fitted to the inside wall of a shoe heel so as to resiliently tension the wall along top line portions thereof. The stiffener is a U-shaped strip of springy resilient material, the upper edges of the arms of the U curving downwardly, at least along parts near where the stiffener is to be attached to the shoe. The curve is directed away from the base of the U. A projection or peg extends upwardly from about the mid-point of the base of the U.

3,613,275
SIGN MODULE
Edward M. Caferro, Spokane, Wash., assignor to American Sign & Indicator Corporation, Spokane, Wash.
Filed Apr. 21, 1969, Ser. No. 817,825
Int. Cl. G09f *11/28*
U.S. Cl. 40—31 **2 Claims**

A sign module and display sign combination comprised of a plurality of such modules is disclosed in which each

module is a self-powered unit having a flexible tape for the display of visual information. Selected display areas spaced identically along the length of each tape are positioned before a lamp unit in a plane tape flight. A plurality of such modules can be combined in horizontal rows



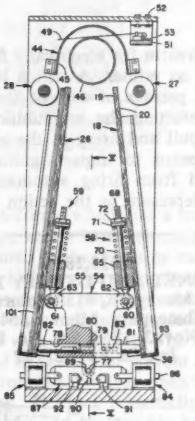
and vertical columns to provide a flexible sign display which can be changed at will. Control of the tape within each module is entirely mechanical and remote operation can be achieved by manual or automatically operated control units utilizing electrical signals.

3,613,276

CHART DISPLAY APPARATUS

Richard M. Johnson and William G. Redmond, Dallas, Tex., assignors to LTV Electrosystems, Inc., Greenville, Tex.

Filed Aug. 28, 1969, Ser. No. 853,867
Int. Cl. G09f *11/30*
U.S. Cl. 40—36 **14 Claims**



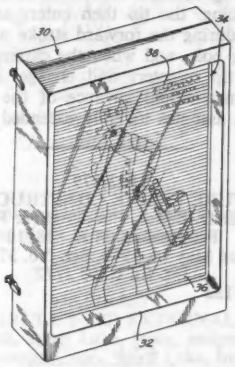
An apparatus for successively exhibiting a plurality of charts includes first and second means for supporting the charts in parallel alignment, the first and second supporting means being positioned such that the charts on one supporting means are adjacent and approximately parallel to any charts on the second supporting means but facing in an opposite direction, and means for sliding the outer chart from either of the supporting means against a deflecting shield and onto the other supporting means. Provision is made for reversing the sequence such that previously shown charts may be repeated.

3,613,277

APPARATUS FOR THE SEQUENTIAL AND SELECTIVE PROJECTION OF GROUPS OF STRIPS OR THE LIKE AND CASSETTES FOR THE INSTALLATION OF THE STRIPS IN A HOUSING

Robert Joseph Rose, Los Angeles, and Frank Wilson Sanders, Topanga, Calif., assignors to Multimatic Displays, Inc., Great Neck, N.Y.

Filed Jan. 27, 1969, Ser. No. 794,309
Int. Cl. G09f *11/00*
U.S. Cl. 40—65 **24 Claims**



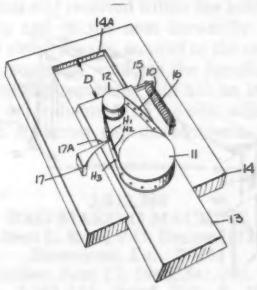
A display device in which groups of strips constitute respective displays which are sequentially exhibited through a window in a casing. The strips are interleaved and, by groups, are projected to an extended position and removed to a withdrawn position. When all the strips of a group are in extended position, they are in overlapping relation with respective edge portions exposed as in a louvre arrangement. A motor operates at constant speed to drive a cam arrangement to control movement of the strips with a certain pattern of movement according to which all groups are displaced to and from the extended position. The strips are readily removable and several embodiments are shown with the strips in a casette arrangement.

3,613,278

DISPLAY ADVANCE MECHANISM

David C. Hughes, White Plains, N.Y., assignor to Child Guidance Toys Inc., Bronx, N.Y.

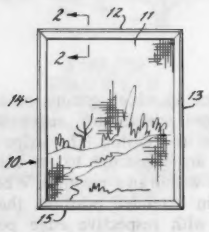
Filed Jan. 2, 1970, Ser. No. 95
Int. Cl. G09f *11/26*
U.S. Cl. 40—96 **7 Claims**



A display device in which numbers or other data to be presented appear sequentially along a movable endless tape supported between spaced guides mounted on a carriage, the tape having a continuous series of equi-

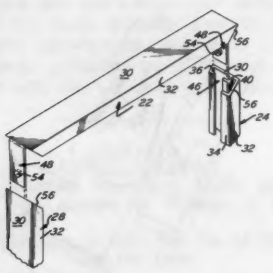
spaced sprocket holes formed therein. The carriage is slidable with respect to a bed having a claw fixedly mounted thereon, the tip of the claw being adapted to enter said holes during the forward and reverse stroke of said carriage, but to effect engagement therewith only during the reverse stroke. The carriage is spring-biased normally to assume a fully extended position relative to said bed, at which position the tip is admitted into one of said holes. When the carriage is pushed in against the action of the spring by a distance which is greater than the spacing between successive holes but less than twice the spacing, the tip then enters and passes over the next hole during the forward stroke without entering the succeeding hole, and when the carriage is thereafter released, the tip re-enters and engages said next hole to cause an incremental advance of the tape until the carriage again assumes its fully extended position.

3,613,279
PICTURE FRAME CONSTRUCTION
Myer D. Belfor, Cooper River Plaza, Pennsauken, N.J. 08110
Filed May 14, 1970, Ser. No. 37,245
Int. Cl. G09f *1/12*
U.S. Cl. 40—152 **8 Claims**



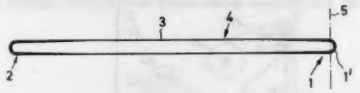
A picture frame including a plurality of elongate sections each of constant cross-sectional configuration and provided with an open-ended through passageway for frictionally receiving a connector key, and backing means for backing a picture or the like within the frame.

3,613,280
PICTURE FRAMING KIT
Benjamin Tuchinsky, 7 Fernwood Court 07011; David Howard Stein, 301 Park Slope 07013; and Jeffrey J. Friedlander, 565 Grove St. 07011, all of Clifton, N.J.
Filed Sept. 2, 1969, Ser. No. 854,697
Int. Cl. G09f *1/12*
U.S. Cl. 40—155 **6 Claims**



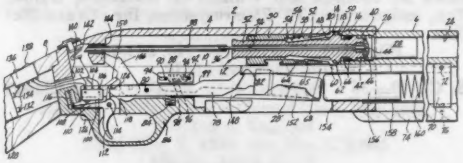
A frame is provided which is comprised of extruded aluminum side members. Each of the side members includes an integrally formed channel which enables the frame to be utilized for pictures of both narrow and wide thicknesses.

3,613,281
PLASTIC FILE FOLDERS
Walter Lennartz, 9/BRD Waldstrasse, 806 Rothschwaige, near Dachau, Germany
Filed Mar. 6, 1970, Ser. No. 17,120
Claims priority, application Germany, Mar. 7, 1969, P 19 11 729.4
Int. Cl. B42f *7/00*
U.S. Cl. 40—359 **3 Claims**



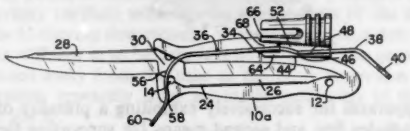
File folder of plastic having thickened sections at critical wear zones. The file folder is made from tubular plastic extruding in such a manner as to have thickened zones at diametrically located portions. The tubing is then flattened with the fold points centrally of the thickened zone. Lastly, the flattened tubing is trimmed adjacent a fold to eliminate the bight but to leave thickened free edges.

3,613,282
ELECTRICAL IGNITION SHOTGUN FOR FIRING CASELESS AMMUNITION
Marcus Ramsay, New Haven, Conn., assignor to Olin Corporation
Filed Sept. 15, 1969, Ser. No. 857,665
Int. Cl. F41c *19/12*
U.S. Cl. 42—84 **18 Claims**



A multi-shot firearm for electrically firing caseless ammunition having no primer. A switch is actuated by the trigger to permit passage of current from a capacitor to an electrode contacting the ammunition. Elapsed time between trigger pull and firing of the ammunition is decreased as compared to impact ignition firearms. The gun is prevented from firing automatically should the trigger be kept depressed as the action is operated.

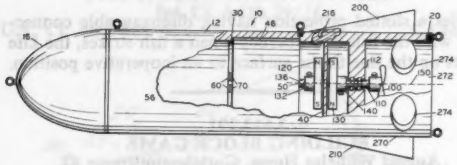
3,613,283
BAYONET AND UTILITY KNIFE
William B. Mozey, Jr., 4139 Colorado Ave. S., Minneapolis, Minn. 55416
Filed Nov. 3, 1969, Ser. No. 873,349
Int. Cl. F41c *27/02*
U.S. Cl. 42—86 **6 Claims**



A bayonet designed as a utility knife having a handle shaped to be conveniently gripped, the handle having a hollow center to house one blade of a reversible double-bladed knife and having a slotted band secured in said handle cooperating with a groove in said handle to form a keyway to lockably engage a key fixedly attached to the flash suppressor of a rifle and/or a machine gun or submachine gun.

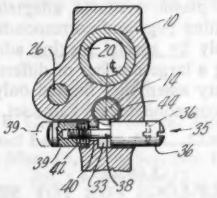
3,613,284
FISHING DEVICE
Edgar F. Anderson, Rte. 2, Box 11, Wakefield, Nebr. 68784
Continuation-in-part of abandoned application Ser. No. 727,849, May 9, 1968. This application June 3, 1969, Ser. No. 840,091
Int. Cl. A01k 85/06
U.S. Cl. 43—26.1 6 Claims

A fishing device comprising a tiny motorized trolling submarine having remotely controlled rudder means for steering it upwardly and downwardly to fish at various depths.



The combination described in further combination with an upright line, a tethering line means attached to the submarine and revolvably attached to the upright line for causing the submarine to move in a circular motion about the upright line.

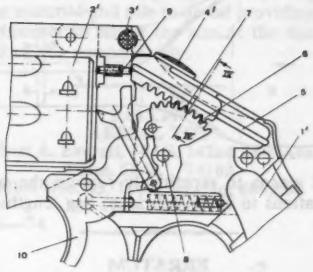
3,613,285
REVOLVER CYLINDER PIN AND LOCK THEREFOR
Ralph C. Kennedy, Wapping, Conn., assignor to Colt's Inc., Hartford, Conn.
Filed Jan. 22, 1970, Ser. No. 4,848
Int. Cl. F41c 1/00
U.S. Cl. 42—59 4 Claims



A revolver has a frame which has a transverse opening in the front portion and a lock mounted in the opening. A cylinder is mounted in the frame by means of a removable cylinder pin which is secured in place by the lock and has a transverse arcuate groove for engagement with the lock and a rearwardly extending longitudinal guide recess that communicates with the groove. The recess terminates before the rear end of the pin to prevent the complete removal of the pin from the revolver when the lock is in the assembled condition. The lock is partially received within the transverse groove and is movable between a locked position in which it contacts the cylinder pin and an unlocked position in which it is free of locking contact with the cylinder pin to enable the cylinder pin to slide over the lock.

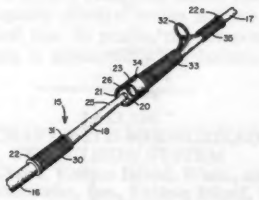
3,613,286
REVOLVER WITH DOUBLE ACTION
Klaus Mayer, 9 Arnsberger Strasse, Neheim-Husten, Germany
Filed Apr. 16, 1969, Ser. No. 816,656
Int. Cl. F41c 19/00
U.S. Cl. 42—65 2 Claims

A revolver with double action is characterized in that the actuating part is shaped as a flat tension slide. This slide is guided in a straight movement along an end edge of the casing to the firing pin. The slide has teeth upon



its lower side which mesh with a gear segment of an operational member of the firing mechanism.

3,613,287
GLASS FERRULE WITH EXTERNAL SLEEVE
Thomas E. Grein, Spirit Lake, Iowa, assignor to Berkley & Company, Inc., Spirit Lake, Iowa
Filed Apr. 7, 1969, Ser. No. 813,868
Int. Cl. A01k 87/02
U.S. Cl. 43—18 GF 4 Claims

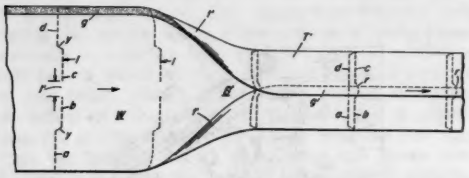


A fishing rod including a thin-walled shaft formed of a plurality of individual tapering rod segments, the forward end of certain segments being adapted to be mated to the trailing end of the next adjacent forward segment, the segments adapted to be retained together to form a single unitary structure. Ferrule means releasably retain the mated segments together and comprises a male coupling prong secured to the forward end of one of the mating segments and received within the hollow inner core of the trailing end of the next forwardly adjacent segment. A hood sleeve means, secured to the outer periphery of one of the segments, encloses the junction established between the mating segments, and has an inner diameter exceeding the outer diameter of the next adjacent segment so as to form a narrow gap therebetween.

3,613,288
BAG MAKING MACHINE
Albert L. Ross, P.O. Drawer 1120, Hammond, La. 70401
Original application June 17, 1968, Ser. No. 737,640, now Patent No. 3,561,332, dated Feb. 9, 1971. Divided and this application Apr. 24, 1970, Ser. No. 43,290
Int. Cl. B31b 49/04
U.S. Cl. 93—35 R 14 Claims

A machine for making notion and millinery type bags having a lip on one layer extending beyond the edge of the other layer, the machine including means for trans-

versely perforating the paper web in successive steps in advance of and following a folding of the web into tube

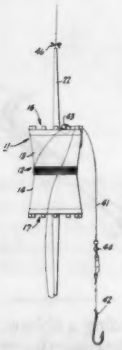


form, and means to repetitively rupture the tube along the perforations to form individual bag lengths.

ERRATUM

For Class 43—26.1 see:
Patent No. 3,613,284

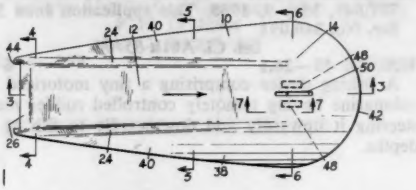
3,613,289
SPINNING BOBBER
Harold J. Wehren, Rte. 1, Box 315,
Eagle, Idaho 83616
Filed Sept. 15, 1969, Ser. No. 857,864
Int. Cl. A01k *93/00*
U.S. Cl. 43—43.11 4 Claims



A buoyant element or a bobber through which fishing line is threaded and about which such line is wound to a length equal to a desired depth in water of ultimate fishhook location. End projections and pockets are provided for the looping of line thereabout and removable retention of a sinker weight, respectively.

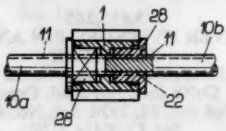
3,613,290
TROLLING UNDERWATER FISHING KITE
Clissolde L. Louthan, 7477 N. Wayland,
Portland, Oreg. 97203
Filed Feb. 24, 1970, Ser. No. 13,309
Int. Cl. A01k *93/00*
U.S. Cl. 43—43.13 16 Claims

A trolling underwater fishing kite having a buoyant wedge-shaped body portion with vane means extending along the sides and around the front and assuming a narrowed tapered configuration toward the rear. The vane means at the front is concave downwardly as viewed in transverse cross section. The bottom of the body portion has a downward curvature at about the center of gravity of the kite. The body portion is buoyant and has a formation of mass arranged such that when laid in water the forward end of the body portion noses down a slight amount. The body portion may include longitudinally shiftable ballast means which assist in performance of the kite. The forward portion of the kite has a vertical slot for receiving the fish line, and the bottom of the kite



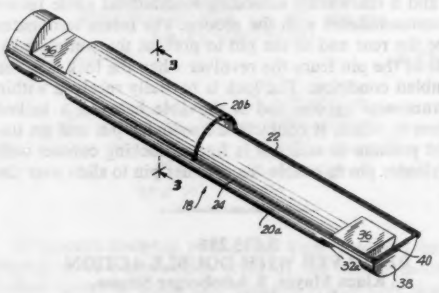
carries a slotted projection having disengageable connection with the fish line whereby when a fish strikes, the kite floats up the line to the surface to an inoperative position.

3,613,291
BUILDING BLOCK GAME
August Wilhelm Howe, Gottelmannstrasse 42,
Mainz (Rhine), Germany
Filed Sept. 11, 1969, Ser. No. 857,072
Claims priority, application Austria, Sept. 18, 1968,
A 9,110/68
Int. Cl. A63h *33/00*
U.S. Cl. 46—16 13 Claims



A building block set, essentially consisting of modular components of a plastic material, adapted for fixed assembly by interfitting pegs and corresponding holes and/or rotary assembly by special locking adapters to each other for forming a large number of different fixed structural and/or rotary assemblies limited only by the number of individual components of a game set.

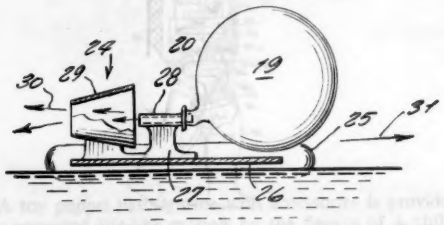
3,613,292
NESTING HALF-LOGS FOR TOY STRUCTURES
Robert G. Schilling, Jr., Flushing, N.Y., assignor to Robert G. Schilling, Flushing, and Andy Connor, Spring Valley, N.Y.
Filed Oct. 30, 1969, Ser. No. 872,566
Int. Cl. A63h *33/08*
U.S. Cl. 46—20 7 Claims



A toy structure such as a log cabin. The toy structure includes elongated log-simulating bodies in the form of hollow tubular units which are longitudinally split so that

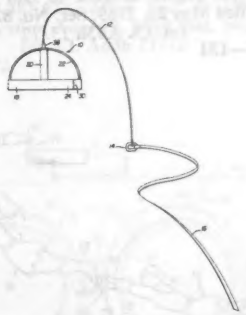
each unit is composed of a pair of elongated trough-shaped members coacting to form the elongated tubular log-simulating unit. Thus, when the structure is taken down and stored away the log-simulating units can be disassembled and all of the components will form half-logs which can be nested within each other to enable a large number of these components to be stored in a small space.

3,613,293
FOAM SKIMMER
Richard H. Scott, 55 N. Preston St., Centerburg, Ohio 43011
Filed Oct. 17, 1969, Ser. No. 867,129
Int. Cl. A63h *29/16*
U.S. Cl. 46—44 **1 Claim**



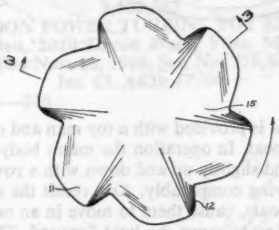
A toy for use upon the surface of water, the toy comprising a catamaran comprised of two spaced apart pontoons with a platform therebetween, the platform supporting a horizontal tube to one end of which a nozzle of an inflated rubber balloon is attached, the opposite end of the tube being directed toward a conical venturi, the discharged air from the balloon passing through the tube and venturi so to cause the toy to be propelled forwardly across the water.

3,613,294
HAT TOY
David E. Graham, 4708 NE. 23rd Ave., Fort Lauderdale, Fla. 33308
Filed Mar. 13, 1970, Ser. No. 19,304
Int. Cl. A63h *1/32*
U.S. Cl. 46—51 **4 Claims**



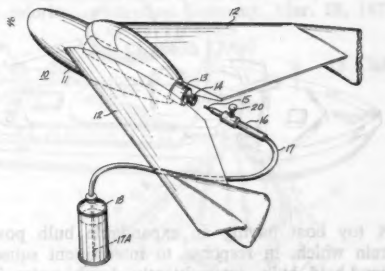
A hat toy worn on the head of a person and operated by swinging the head to make figures with a weight and streamer of the toy. The hat portion includes a circular elastic headband which fits tightly on the head of a person, and crossbands extending across the headband in an arc and having a central anchoring portion to which a free swinging flexible line is attached. A weight is affixed to the end of the line and carries a streamer which traces the path of the weight as the weight loops about when the head is swung. In a preferred embodiment, the headband is split and has overlapping ends respectively carrying hooking material and pile material providing an overlap fabric fastener to adjust the size of the headband to fit the head of the person firmly.

3,613,295
AERIAL TOY
Robert A. Everett, 704 S. 142nd East Ave., Tulsa, Okla. 74108
Filed Dec. 12, 1969, Ser. No. 884,556
Int. Cl. A63h *27/00*
U.S. Cl. 46—74 **3 Claims**



The disclosure is of a hollow unitary body, which has a series of airfoils joined together and extending from their center to form a unitary composite airfoil. Each of the airfoils have a negative dihedral design and are weighted at their peripherical tips. In profile, the composite airfoil is shown as having a substantially flat bottom.

3,613,296
TOY AIRCRAFT WITH PRESSURIZED FLUID PROPULSION SYSTEM
Charles J. Green, Vashon Island, Wash., assignor to Vashon Industries, Inc., Vashon Island, Wash.
Filed Jan. 30, 1970, Ser. No. 7,021
Int. Cl. A63h *27/00*
U.S. Cl. 46—76 A **18 Claims**

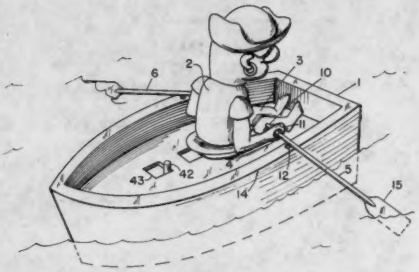


A toy aircraft having wings which provide lift in combination with an engine operating on jet principles. The propulsion engine is filled with liquid Freon just prior to launch. The vapor pressure of the Freon forces Freon in the liquid state from the rear of the engine and thus thrust is provided to the craft. As liquid is discharged the center of gravity of the plane changes causing intricate maneuvers to be performed and repeated dive and climb operations to take place. Details of the propulsion engine are provided.

3,613,297
TOY ROWING BOAT AND ACTUATING MECHANISM

Patrick M. Tomaro, Maplewood, N.J., assignor to Remco Industries, Inc., Harrison, N.J.

Filed Sept. 19, 1969, Ser. No. 859,363
Int. Cl. A63h *23/04*
U.S. Cl. 46—23 4 Claims

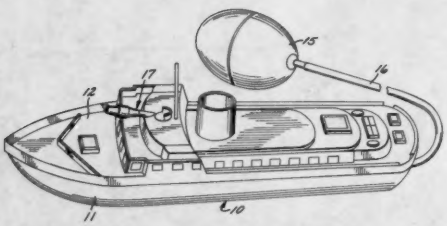


A toy boat is provided with a toy man and oars actuated to row the boat. In operation the man's body moves back and forth and slightly up and down with a rowing motion, his legs moving comparably. As a result the man's hands, holding the oars, cause them to move in an oscillatory, elliptical fashion to move the boat forward. The motion of the man's body is caused by an eccentrically operated linkage within the boat. The boat is steered by moving the operating mechanism laterally to move the center of gravity and so incline the boat to one side of the other. This will cause the oar on one side or the other of the boat to dip more deeply into the water. The actuating mechanism may be used to animate other toys requiring a similar oscillatory, elliptical motion.

3,613,298
TOY BOAT WITH PROPULSION MEANS AND WATER CANNON

Jan Okonski, 1032 Andrews, Tustin, Calif. 92680

Filed Sept. 3, 1969, Ser. No. 854,880
Int. Cl. A63h *23/06*
U.S. Cl. 46—95 12 Claims

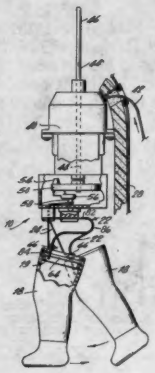


A toy boat having an expandable bulb power unit therein which, in response to intermittent squeezing of a hand-held bulb, intermittently draws water into and ejects water from a pressure chamber through an exit port to cause the boat to be propelled forward and to squirt water out of a water cannon which is on the boat and connected to the power unit. The discharge port through which the propulsion water is ejected is specially shaped and has a specially shaped guide structure around it in order to spread the propulsion water in a preferred manner. Said boat has a special guide structure around the exit port in order to draw water in front of the exit port and force that water rearwardly to increase the propulsion effectiveness of the water being ejected through the exit port.

3,613,299
ANIMATED DOLL

Francis Robert Amici, Northford, Conn., and Ralph Bornn, South Farmingdale, N.Y., assignors to Ideal Toy Corporation, Hollis, N.Y.

Filed July 16, 1969, Ser. No. 842,156
Int. Cl. A63h *11/00*
U.S. Cl. 46—120 11 Claims

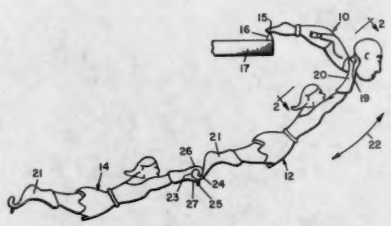


An animated doll is described as comprising a doll body, a head movably mounted on the body for complex motion and legs for walking motion. The motion of the head and legs is provided by a motor which rotates a drive shaft. The drive shaft terminates at one end in an angularly offset shaft extension projecting into the head of the doll and at the other end as the axis of a crank. The crank cooperates with a crank arm which has a crank pin movable by the rotating action of the crank in an elongated slot in the base of a body housing. Harnesses and C-springs depend into each leg, the springs mounting the legs and the harnesses loading the springs for flexure alternately by means of their attachment to the crank pin.

3,613,300
SECTIONAL BALANCING TOY

Ernest Seguin, Montreal, Quebec, Canada, and Max Whiteman, 5450 King Edward Ave., Montreal, Quebec, Canada; said Seguin assignor to said Whiteman

Filed May 22, 1969, Ser. No. 826,903
Int. Cl. A63h *13/12*
U.S. Cl. 46—131 6 Claims



A set of elongated body members including a primary member which is rockable in a vertical plane about a fulcrum. The set also includes additional body members which are rigidly but separably connectable to the primary member and to one another to provide a unitary rockable assembly which has its center of gravity disposed below the fulcrum.

3,613,301
TOY PUPPET-LIKE FIGURINE WITH ACCESSORIES

Sid Noble, 100 Warren Road, West Orange, N.J. 07052, and George Gilder, 6738 108th St., Forest Hills, N.Y. 11375

Continuation-in-part of application Ser. No. 859,269, Sept. 19, 1969. This application June 22, 1970, Ser. No. 48,042

Int. Cl. A63h *3/14*

U.S. Cl. 46—154 16 Claims

A toy puppet-like figurine with accessories is provided for animated life-like motion by the fingers of a child. The figurine has a rigid upper body including a torso and a removable elastic fabric lower body forming hollow legs connected thereto. The elastic fabric lower body includes an attached garment for covering the upper body, the garment being open at the back for entry of the child's fingers and having a recess formed in the upper rear of the legs dimensioned to receive two fingers for insertion into the hollow legs. A retention means is secured high up on the flat back of the torso between the shoulders to hold at least one finger directly against the back of the upper body providing upright support to the torso. The individual accessories are shaped to receive and be frictionally retained by the legs when rigidified or distended by the fingers.

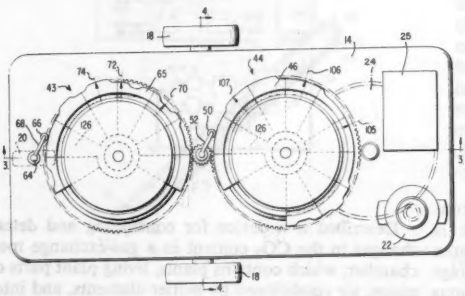
3,613,302
CAM CONTROLLED TOY VEHICLE

George D. Stohrer, 2810 Bosworth Lane, Bowie, Md. 20715

Original application May 1, 1967, Ser. No. 635,067, now Patent No. 3,481,072, dated Dec. 2, 1969. Divided and this application Aug. 28, 1969, Ser. No. 853,794

Int. Cl. A63h *11/10*

U.S. Cl. 46—202 8 Claims



A motor driven toy vehicle which includes selectively operable locomotion means for moving the vehicle in opposite directions. First follower means for selecting the direction of motion of the locomotion means is controlled by first cam means driven in timed relation to the motor. Selectively operable steering means for steering the vehicle is controlled by second follower means operated in response to the motion of second cam means driven in timed relation to the motor. At least one of the first and second cam means includes a base moved along a predetermined path relative to the adjacent corresponding follower means. A plurality of cam members detachably secured to the base have peripheral portions extending different distances outwardly of the path of motion of the base. The peripheral portions of the various cam members successively contact and move the adjacent corresponding follower means which in turn controls the operation of the vehicle in timed relation to the motor.

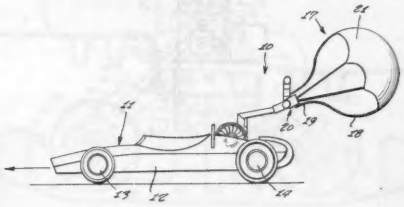
3,613,303
BALLOON POWER TURBINE TOY ENGINE

Herman Allen, 2020 Daron Place, Flint, Mich. 48505

Filed Nov. 18, 1968, Ser. No. 776,522

Int. Cl. A63h *17/00*

U.S. Cl. 46—206 4 Claims



A toy vehicle operated by pneumatic power for the purpose of propelling the toy forwardly, and comprising a wheeled vehicle upon which there is secured an inflated balloon from which compressed air is forced against a turbine connected through a gear train to the driving wheels of the vehicle.

3,613,304
TRACK TOY

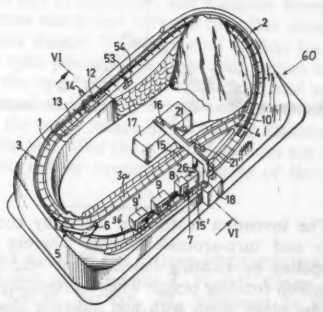
Alfred Einfalt, Nuremberg, Germany, assignor to Firma Gebruder Einfalt, Nuremberg, Germany

Filed June 16, 1970, Ser. No. 46,637

Claims priority, application Germany, Mar. 28, 1970, G 70 11 453.3

Int. Cl. A63h *17/00*

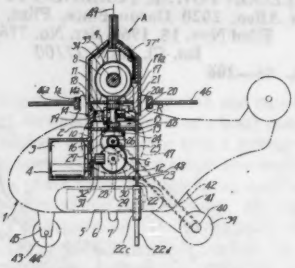
U.S. Cl. 46—206 18 Claims



A track toy comprises a base simulating a mountain landscape traversed by a continuous track including an upgrade and one or more downgrades. Toy vehicles are

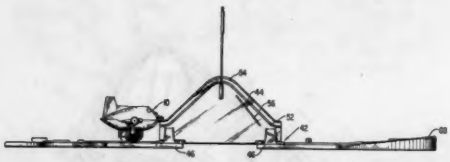
power driven up the upgrade and roll down the downgrades by force of gravity. A control station is associated with each downgrade for selectively arresting and releasing a vehicle rolling down the grade. Control of the vehicle is effected by moving a stop member constituting part of each station into and out of engagement with the vehicle on one of the downgrades.

3,613,305
VERTICALLY AND HORIZONTALLY MOVABLE TOY
Isamu Suzuki, Tateishi, Japan, assignor to Tomy Kogyo Co., Ltd., Tokyo, Japan
Filed Sept. 24, 1969, Ser. No. 860,659
Claims priority, application Japan, Sept. 27, 1968, 43/84,713
Int. Cl. A63h *17/00*
U.S. Cl. 46—206 **6 Claims**



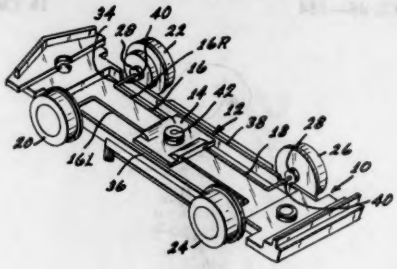
A vertically and horizontally movable toy which comprises motor means, reel means operatively connected to said motor means and arranged to wind and unwind a string suspending the toy from a ceiling, a reversing gear for said reel means, vertically outwardly extending slidable means for operating said reversing gear, and wheel means driven by said motor means for propelling the toy on a supporting surface.

3,613,306
TOY AIRPLANE AND TRACKWAY
Toshikatsu Aria, Tokyo, Japan, assignor to Tomy Kogyo Co., Ltd., Tokyo, Japan
Filed June 4, 1970, Ser. No. 43,496
Int. Cl. A63h *19/24*
U.S. Cl. 46—216 **3 Claims**



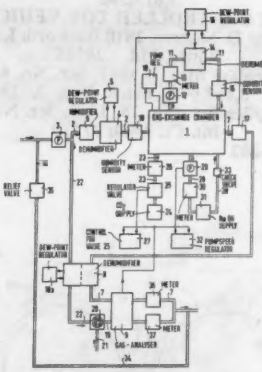
The invention features a trackway comprised of runway and turn-around sections wherein the airplane is propelled by rotating landing gear wheels, a flying area in which rotating pinion wheels projecting from the wings of the plane mesh with and advance along a continuous rack and an aerobatics area in which simultaneously with the advancement of the plane along the continuous rack stationary pinion wheels mesh with and advance along an abbreviated rack causing the plane to somersault.

3,613,307
INDEPENDENT SUSPENSION FOR TOY VEHICLES
William R. Baynes, Palos Verdes Peninsula, and Stephen H. Kaminski, Burbank, Calif., assignors to Mattel, Inc., Hawthorne, Calif.
Filed Oct. 16, 1969, Ser. No. 866,896
Int. Cl. A63h *17/26*
U.S. Cl. 46—221 **9 Claims**



A toy vehicle in which the axle wires are molded into a mounting member that is attached to the vehicle frame. Each axle wire extends a substantial distance along the length of the vehicle between the mounting member and the wheel, to provide independent suspension of the wheels.

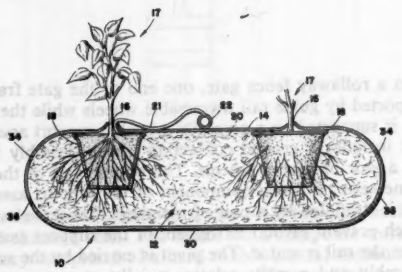
3,613,308
DEVICE FOR REGULATING AND DETERMINING CHANGES OF A CO_2 CONTENT IN A CLIMATIC GAS-EXCHANGE CHAMBER
Erwin Klein, Erlangen, Werner Koch, Grafrath, and Heinz Walz, Eltersdorf, Germany, assignors to Siemens Aktiengesellschaft, Berlin, Germany
Filed Apr. 30, 1969, Ser. No. 820,581
Claims priority, application Germany, Apr. 30, 1968, P 17 73 320.9
Int. Cl. A01g *9/18*
U.S. Cl. 47—17 **7 Claims**



Described is a device for controlling and determining changes in the CO_2 content in a gas-exchange measuring chamber, which contains plants, living plant parts or organisms, air conditioned by peltier elements, and into which measuring gas can be pumped, via a gas line. A gas outlet contains a peltier-cooled dehumidifier and a gas analyzer, wherein a measured value can be determined as a difference between the CO_2 content of the measuring gas and

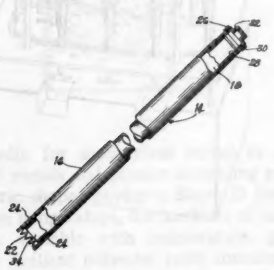
the CO_2 content of a supplied standard gas. The device is so characterized that CO_2 gas can be supplied, via a regulating valve and a flow counter, to the gas-exchange measuring chamber. Also provided is a bypass to the gas-exchange measuring chamber, wherein a flow counter and means for changing the flow and for binding the CO_2 gas are arranged. The regulating valve and the devices which regulate the flow are each provided with a regulating system, wherein the control magnitude of each regulator constitutes the measured value of the gas analyzer.

3,613,309
PLANT CULTIVATION
Charles W. Coburn, Lake Forest, Ill., assignor to Ickes-Braun Glasshouses, Inc., Chicago, Ill.
Filed July 3, 1969, Ser. No. 839,023
Int. Cl. A01g *9/02, 31/02*
U.S. Cl. 47—38 **3 Claims**



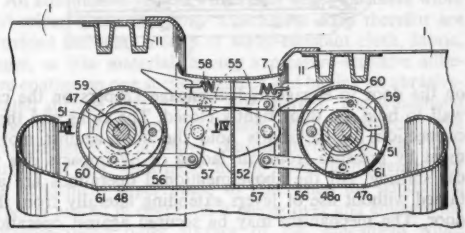
A package for growing plants, and a system including such packages, is disclosed. As illustrated, the package is in the form of a plastic bag containing a root-supporting material, with openings being provided in the top wall of the bag through which the stems of the plants protrude. Within each bag is a liquid distributing tube and, in the disclosed system, means are provided to supply a nutrient in liquid form to the tube of each bag.

3,613,310
WATER LEVEL INDICATING AND CONTROL CONSTRUCTION
Robert W. Rynberk, 4347 W. 109th St., Oak Lawn, Ill. 60453
Filed Sept. 19, 1969, Ser. No. 859,401
Int. Cl. A01g *29/00*
U.S. Cl. 47—48.5 **4 Claims**



A water level indicating and control construction adapted to be inserted in the ground for adding or removing water depending upon the water level detected by the construction. The construction comprises inner and outer tubular members with the outer member being held in the ground and with the inner member being slideable relative to the outer member so that it can be readily removed. Openings are defined by the outer member so that water will be retained in the outer member in accordance with the water level. The inner member serves as a dip stick while also providing means for removing water by suction when an excessive level is detected.

3,613,311
DEVICE FOR OPENING AND CLOSING SLIDING ROOF SECTIONS OF A FREIGHT CAR
Felix Schneider, Eckmannshausen, Paul-Werner Wagener, Netphen (Sieg), and Ernst Neuser, Dreis-Tiefenbach, Germany, and Rudolf Walser, Jegenstorf, Switzerland, assignors to Rheinstahl Siegener Eisenbahnbedarf G.m.b.H., Dries-Tiefenbach Kreis Siegen I.W., Germany
Filed May 15, 1969, Ser. No. 824,841
Claims priority, application Germany, May 18, 1968, P 17 59 609.7
Int. Cl. E05f *11/04*
U.S. Cl. 49—136 **9 Claims**

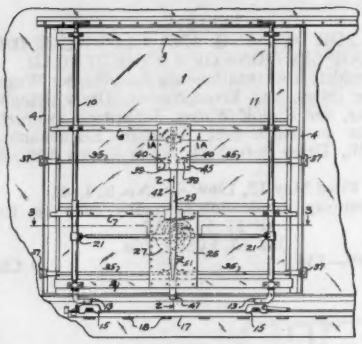


In a device for opening and closing sliding roof sections of containers, such as two-section roofs of freight cars, each roof section is connected by two cables to a respective drum rotatably mounted on a cross connection of a freight car. Each of the two cables is connected to the roof section adjacent a respective end of the latter, and the two cables are wound in opposed directions on the associated drum. Manually operable crank means rotate the drums through transmission means interconnecting the crank means and the drums. Respective clutches are interposed between each drum and the transmission means, and clutch operating means connect the crank means to the clutch means and are operable, responsive to operation of the crank means in a direction to open one roof section, to engage the clutch means connecting the associated drum to the transmission means and to disengage, and maintain disengaged the clutch means interposed between the other drum and the transmission means. When one roof section has been moved to the open position, the other roof section cannot be moved to the open position until the one roof section has been returned to the fully closed position. Continued movement of the crank means in the closing direction for one roof section will, after the two roof sections are in the closed position, initiate opening movement of the other roof section.

3,613,312
RAILWAY CAR PLUG DOOR STRUCTURE
Norbert S. Wolak and Thomas J. Wolak, Cicero, and Alfons W. Ceyer, Berwyn, Ill., assignors to Evans Products Company, Plymouth, Mich.
Filed Aug. 11, 1969, Ser. No. 848,887
Int. Cl. E05d *15/10*
U.S. Cl. 49—220 **11 Claims**

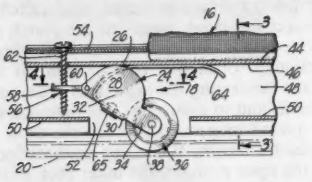
A railway house car having a plug-type door mounted on upright shafts including laterally swinging cranks with

their swinging ends journaled on wheeled carriages traveling on a track running lengthwise on the car body. Mechanism to rotate the shafts and move the door in and out of the opening in the car wall includes a manually operable timing plate paralleling the door and journaled thereon and having a plurality of arcuate cams with followers operatively connected to respective crankshafts. Other cams and followers actuate locking bars slidable



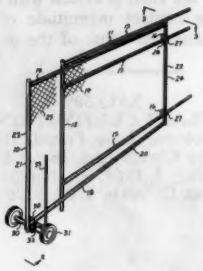
on the door to engage and disengage keepers on the car wall to hold the door tightly closed. The cams and their connections to the shafts hold the door against movement by pressure from car lading or by impacts due to car shifting. All the above-mentioned operations are attained without use of levers extending laterally from the door. The mechanism may be secured against operation by the usual railway car seal but only when the door is completely closed and locked.

3,613,313
SUPPORTING ROLLER ASSEMBLY FOR A SLIDING PANEL
B. J. Helmick, 303 Deborah Court, Upland, Calif. 91786
Filed May 13, 1970, Ser. No. 36,915
Int. Cl. E05d *13/02*
U.S. Cl. 49—420 **13 Claims**



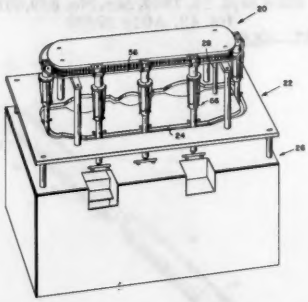
A supporting roller assembly for a sliding panel, such as a sliding screen door, movable along a track and having an edge surface facing the track. The roller assembly includes a spring biased rocker arm having a rounded seating edge seating against the panel edge surface, a track engaging roller on the arm adjacent one end of its seating edge, and attachment means pivotally secured to the arm adjacent the other end of the seating edge for securing the arm to the panel and adjusting the arm to shift the point of contact of its seating edge with the panel edge surface in a direction along the seating edge, thus to adjust the roller toward and away from the panel edge surface.

3,613,314
ROLLAWAY FENCE GATE
Francis L. Ford, 1110 Raymond Ave., Fort Pierce, Fla. 33450
Filed Oct. 17, 1969, Ser. No. 867,163
Int. Cl. E05d *13/02*
U.S. Cl. 49—425 **5 Claims**



In a rollaway fence gate, one end of the gate frame is supported by guide rail traversable wheels while the other end is supported on a pivotally movable support assembly that includes a ground contacting wheel assembly which has a pair of spaced wheels. The bottom rail of the gate frame rests on a seat component of the support assembly and is straddled by a pair of members that serve as stops which prevent pivotal movement of the support assembly when the rail is seated. The pivot is carried by the support assembly and permits relative axially movement of the frame and support assembly, and a lever mounted on the wheel assembly is manipulatable to move the frame relative to the support assembly so as to disengage the stops and permit pivotal movement of the wheel assembly. The mounting for the pivot is adjustable to permit adaptation of the wheels to the ground contour.

3,613,315
AUTOMATIC MAIL OPENER
Robert A. Schickling, B & S Machine Co., 1915 E. Willard St., Philadelphia, Pa. 19134
Filed Nov. 13, 1969, Ser. No. 876,524
Int. Cl. B24b *7/20*
U.S. Cl. 51—74 R **16 Claims**



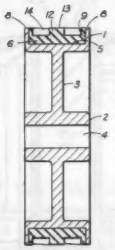
A machine for opening the envelopes in a stack comprises a plurality of arms arranged to pick up envelopes individually from the stack. Each envelope is moved by an arm in a path so that it passes three abrading wheels. One of its edges is opened by the first abrading wheel. The

envelope is then rotated 90° by the arm, and a second edge is opened by the second abrading wheel. The arm then rotates the envelope a further 90° so that a third edge is opened by the third abrading wheel. The arm then deposits the opened envelopes in a stack.

3,613,316
SERRATED CONTACT WHEEL

Richard L. Eten, Vancouver, Wash., assignor to The Carborundum Company, Niagara Falls, N.Y.

Filed Aug. 11, 1969, Ser. No. 848,858
Int. Cl. B24b *21/12*
U.S. Cl. 51—141 **4 Claims**

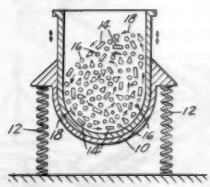


This invention relates to a contact wheel for backing coated abrasive belts. The wheel has a composite working periphery comprised of a hard rubber central section supported by marginal metal sections. The working periphery is serrated having transverse lands and separating grooves extending entirely across the central and marginal sections.

3,613,317
MEDIA FOR FINISHING PLASTICS AND SOFT METALS

John B. Kittredge and Richard L. Larson, White Bear Lake, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Original application May 26, 1967, Ser. No. 641,666, now Patent No. 3,504,124, dated Mar. 31, 1970. Divided and this application June 25, 1969, Ser. No. 869,980
Int. Cl. B24b *31/02*
U.S. Cl. 51—164.5 **3 Claims**

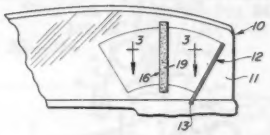


Finishing media for mechanical barrel or vibratory finishing of soft metals and plastics consisting of discrete flexible polymeric shapes having a Shore D hardness of 45 to 80 at room temperature, the hardness of said shapes being inversely variable with temperature, preferably formed from a resilient polyester resin containing finely divided abrasive having particle diameters below 30 microns, and method of finishing soft articles, including the steps of first agitating in the presence of media at a low temperature whereby increased hardness of media increases metal cut rate and subsequently raising the temperature whereby the metal cut rate is decreased but the surface smoothness produced on articles is greatly increased, plastics being finished in cold water to increase cut rate and minimize softening and swelling.

3,613,318
AUTOMOTIVE VEHICLE WINDSHIELD AND WINDSHIELD WIPER AND WIPER BLADE SHARPENER ATTACHMENT THEREFOR

Henry L. Gianatasio, River Forest, Ill., assignor to Pres-on Products, Inc., Addison, Ill.

Filed Dec. 10, 1969, Ser. No. 883,976
Int. Cl. B24b *19/00*
U.S. Cl. 51—241 R **1 Claim**

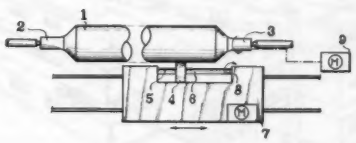


An automotive vehicle windshield and windshield wiper and wiper blade sharpener attachment strip therefor are provided including a strip of water-resistant cloth, fabric, paper, or like material, having a pressure-sensitive adhesive coating on one surface thereof and having an abrasive-coated surface on the other side thereof. The windshield wiper blade sharpener attachment strip is attached by the pressure-sensitive adhesive coating thereon to the outer surface of the windshield in the path of movement of the windshield wiper blade so that when the windshield wiper is moved in operation it passes over and engages the abrasive-coated outer surface of the windshield wiper blade sharpener attachment strip, thus sharpening and maintaining the wiping efficiency of the outer surface of the flexible rubber or like windshield wiper blade.

3,613,319
METAL ROLLING WORK ROLL AND METHOD OF MAKING SAME

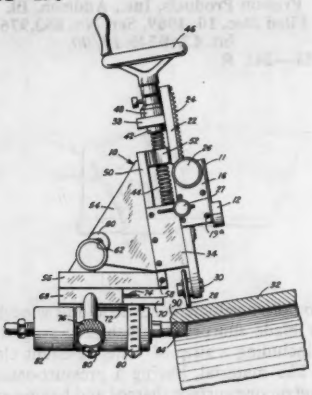
Shojiro Takimura, Tomeji Doi, and Hiroshi Kuawamoto, all % Nippon Kokan Kabushiki Kaisha Mizue Iron Works, 5–1 Mizue-cho, Kawasaki-shi, Kanagawa-ken, Japan

Continuation-in-part of application Ser. No. 678,603, Oct. 27, 1967. This application Mar. 2, 1970, Ser. No. 15,444
Int. Cl. B21b *27/02*
U.S. Cl. 51—289 R **9 Claims**



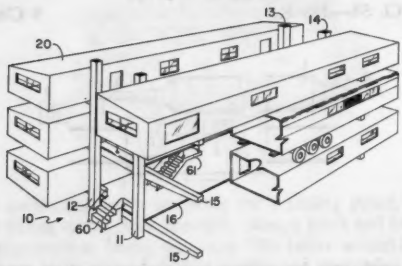
A work roll for rolling low carbon steel or the like has a surface which is dull finished by grinding with a #40 or less roll grinder to form circumferentially oriented impressions on the surface of the work roll. These work rolls impart surface roughnesses and qualities to the rolled steel strip whereby the roughness of the surface in the direction transverse to rolling is greater than the roughness in the direction of strip rolling, to thereby reduce sticking tendencies, improve the surface luster, and improve manufacturing economies.

3,613,320
PIPE MACHINING METHOD
Perciptimus J. Mighton, Tulsa, Okla., assignor to Mary C. Harter, Tulsa, Okla.
Application Aug. 8, 1966, Ser. No. 570,978, now Patent No. 3,501,872, which is a continuation-in-part of application Ser. No. 293,479, July 8, 1963, now Patent No. 3,265,679. Divided and this application Oct. 8, 1969, Ser. No. 871,340
Int. Cl. B24b *1/00*
U.S. Cl. 51—290 **9 Claims**



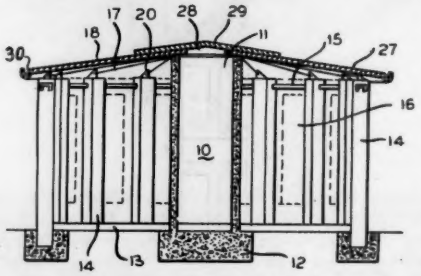
A method of preparing the end of a tubular member wherein the machining operation on the said end is indexed or referenced from the outer periphery of the pipe. A follower roller or indexing wheel rides circumferentially around the outer periphery of the pipe during operation of a pipe end preparing apparatus. A machining or grinding tool is carried by the wheel support structure in such a manner that the tool moves both circumeferentially and radially simultaneously with the indexing wheel thus assuring that the function being performed on the pipe end is directed or reversed from the contour of the outer periphery of the tubular member.

3,613,321
BUILDING CONSTRUCTION
Karl R. Rohrer, 264 Kenilworth Drive, Akron, Ohio 44313
Filed July 9, 1969, Ser. No. 840,246
Int. Cl. E04b *1/34*
U.S. Cl. 52—73 **4 Claims**



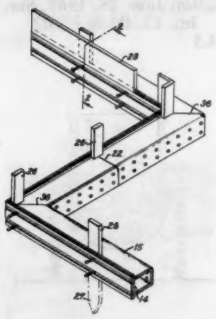
A method and structure for building construction in which a first pair of opposed vertical, hollow, spaced apart columns is erected and then a second pair of opposed vertical, hollow columns is erected in spaced apart relationship to the first pair of columns. One or more horizontal cantilevered beams are then secured to each pair of columns with their outboard ends projecting outwardly beyond each of the columns so as to form an H-shaped frame. Prefabricated housing components can then be mounted on the extending arms of the beams and utility connections can then be mounted on the extending arms of the beams and utility connections can be made through the hollow columns with the H-shaped arrangement providing an open space between adjacent frames which permits installation of stairs and other appurtenances.

3,613,322
CABLE SUPPORTED ROOF CONSTRUCTION
Thomas H. Czarnecki, Sr., 13543 N. Cedarburg Road 64–W, Mequon, Wis. 53092
Filed Mar. 27, 1970, Ser. No. 23,208
Int. Cl. E04b *7/14*
U.S. Cl. 52—83 **6 Claims**



A building may be erected in a simple and efficient manner by suspending the roof on cables extending outwardly from a central pillar. The periphery of the roof rests on a cylindrical outer wall. This wall may be constructed as a closed wall, or with windows, doors or the like. A centrally disposed pillar-like portion may be also accessible as a room for use.

3,613,323
FORM AND DRAIN TILE
Fred J. Hreha, 226 Sullivan St., Exeter, Pa. 18644
Filed Mar. 10, 1970, Ser. No. 18,230
Int. Cl. E02d *27/04;* E04b *1/70*
U.S. Cl. 52—169 **15 Claims**



This specification discloses a form intended for use in the casting of concrete or cement foundations and which has a drain tile integral with an element thereof. The form comprises two flat wall sections detachably connected. A drain tile is integrally formed on the lower wall section and is of rectangular cross section presenting spaced horizontal walls and a side wall. The latter is formed wtih a plurality of spaced drainage openings and the horizontal walls are formed at spaced intervals with aligned slot-like apertures adjacent to the wall section from which they extend. Stakes are driven through these apertures and nailed to the upper wall section of the form.

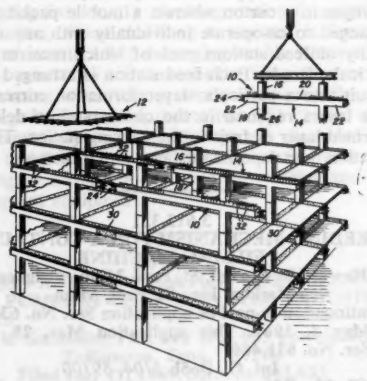
A mechanical interlock between the lower wall section and the material cast is provided and may take different forms.

3,613,324
DOOR SEAL UNIT
Gary L. Conger, 3043 W. Mason St., Green Bay, Wis. 54303
Filed May 12, 1969, Ser. No. 823,908
Int. Cl. E04h *14/00*
U.S. Cl. 52—173 **4 Claims**

The seal unit of this disclosure includes a pair of similar side pads and a top pad formed of a polyurethane foam. Each side wall pad is formed of a tapered section having a relatively narrow base face secured to the adjacent exterior structure wall immediately adjacent an opening. An inner side face extends from the narrow end outwardly of the structure and inwardly of the space or opening between the pads to the outer edge portion of a wide sealing face defining a sealing lip portion. When the trailer is backed into abutting engagement, it engages the lip portions which deflect and form a weather-tight seal.

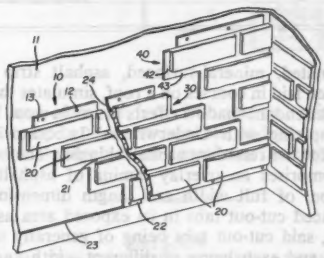
The top wall pad spans the sidewall pads and is also formed of tapered cross-section having a relatively deep mounting base and a slanting top surface to shallow front face. A fabric flap extends downwardly from the top pad between the two side wall pads to which it is secured. A drop flap is secured to the lower end of the first flap.

3,613,325
CONCRETE CONSTRUCTION
Alfred Alphonse Yee, Suite 810, 1441 Kapiolani Blvd., Honolulu, Hawaii 96814
Filed July 10, 1969, Ser. No. 840,725
Int. Cl. E04b *5/04, 5/16*
U.S. Cl. 52—236 **4 Claims**



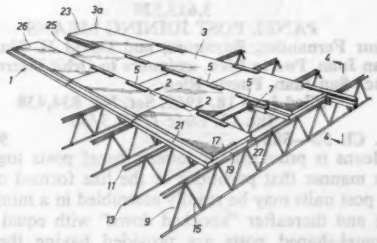
A construction system utilizing a plurality of combination column and beam units or trees assemblable so as to define a concrete building frame for the reception of a plurality of pre-formed concrete slabs. Each tree consists of upper and lower column sections which join at mid-height to similar column sections on subjacent and superjacent trees, the joining being effected through embedded splice sleeves. Each upper column section is spaced above the transverse tree beam to which it is joined for the accommodation of a slab joining pour whereby a positive interlock between the beam-supported slabs and the frame unit or tree is achieved.

3,613,326
PREFORMED SIMULATED BRICK PANEL HAVING STEPPED EDGES
Robert E. Mollman, Moreland Hills, Ohio, assignor to Alside International Corporation, Akron, Ohio
Filed Oct. 3, 1969, Ser. No. 863,610
Int. Cl. E04c *1/10, 2/10*
U.S. Cl. 52—314 **1 Claim**



A preformed panel simulating brick or other stone material laid in successive courses and being characterized by the presence of stepped longitudinal edges that are formed for tongue and groove aligned engagement so as to minimize the presence of vertical joints upon installation.

3,613,327
STRUCTURAL SYSTEM FOR WALLS OR CEILINGS OR DECKS
Herbert Lynwood Hall, 1842 Tattenhall, Houston, Tex. 77008
Filed Mar. 27, 1969, Ser. No. 812,563
Int. Cl. E04b *5/10, 5/52*
U.S. Cl. 52—489 **1 Claim**

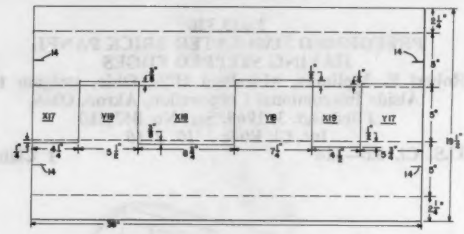


An improved structural system comprising a plurality of panel-like members each having parallel ship lap edges for cooperative engagement with one another. Disposed intermediate the ship lap edge of each panel member is attachment means designed to engage and joint the panel edges together. In installation the panels are laid perpendicularly to the structural supports of the building and a clip attachment which is integral with each attachment member is adapted to engage the structural support. Each of the panels are disposed with their butt end joints in staggered relationship with respect to each adjacent panel.

3,613,328
LAMINATED STRIP SHINGLE WITH MULTIPLE EXTENDED SHADOW-PRODUCING TABS OF VARIABLE WIDTH AND LENGTH

Albert R. Morgan, Jr., Paul R. Antoun, Howard E. Callahan, and Theodore R. Maugel, Cincinnati, Ohio, assignors to Panacon Corporation, Cincinnati, Ohio

Filed May 13, 1970, Ser. No. 36,891
Int. Cl. E04d *1/00*
U.S. Cl. 52—555 **19 Claims**



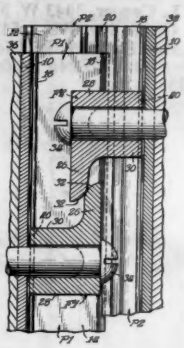
A laminated, mineral-surfaced, asphalt strip shingle, which, when laid in courses on a roof, simulates the irregularity and attendant shadow effects found in wood shingles, while complying with Underwriters' Laboratories, Inc., standards for fire retardant asphalt shingles. The laminated shingle comprises an overlay lamina of asphalt roofing composition, of full width and length dimensions, with widely spaced cut-out tabs in its exposed area as applied on a roof, said cut-out tabs being of generally rectangular shape, and each being of different width and length. An underlay lamina, constituted by a narrow sheet of the same asphalt composition roofing material with no cut-outs, is laminated adhesively to the underside of the overlay lamina, filling the spaces between the tabs of the overlay lamina and providing tab-simulating areas between said tabs. The tabs of the overlay lamina overhang the lower edge of the underlay lamina, and the underlay lamina is shifted laterally with respect to the overlay lamina by a small amount to cover the butt joint between adjacent underlay laminae in the same course. Vertical alignment marks are provided, such that the underlay lamina overhangs the tops of the cut-outs between tabs of the overlay lamina in the next lower course. A plurality of horizontal laying marks, differently spaced, are provided to create a laying program, which avoids the appearance of repetitive or directional patterning.

3,613,329
PANEL POST JOINING MEANS

Arthur Fernandez, Bayamon, and David H. Humphrey, San Juan, Puerto Rico, assignors to Orbit International, Inc., San Juan, Puerto Rico

Filed June 18, 1969, Ser. No. 834,438
Int. Cl. E04c *1/30, 3/30*
U.S. Cl. 52—582 **9 Claims**

Means is provided for joining panel posts together in such manner that partitions or the like formed of panels and post units may be readily assembled in a minimum of time and thereafter "knocked down" with equal facility. Channel-shaped posts are provided having the flanges thereof interfitting with each other and joined by means of finger wedges concealed inside the channel-shaped posts. The finger wedges are designed to coact with each other by first longitudinally offsetting one channel-shaped post relative to the other, and then sliding them to achieve final alignment, whereupon interlocking tongue and groove connections between the flanges of one channel-shaped member and the flanges of the other channel-shaped member so coact with each other that the two posts form a single substantially rectangular post. These channel-shaped posts may be formed as extrusions of metal, plastic or the like and used for assembling panels together by securing the channel-shaped posts to the edges of panels of wood, plastic, particle board or the like as by means of screws. The channel-shaped posts are provided with mating wedge surfaces so disposed as to spread

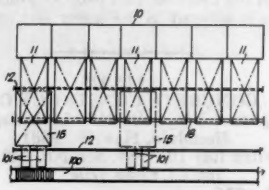


the post flanges as the post webs are drawn toward each other by the finger wedges, and the spreading action effects entry of the tongues into the grooves of the flanges to attain final assembly of the two posts into a single rectangular post.

3,613,330
METHOD OF AND APPARATUS FOR PACKING BATCHES OF SIZED AND/OR GRADED FRUIT

Izak Johannes Voullaire, Monak, New South Wales, Australia (P.O. Box 543, Mildura, Victoria 3500, Australia)

Filed Sept. 11, 1969, Ser. No. 857,159
Claims priority, application Australia, Sept. 13, 1968, 43,356/68
Int. Cl. B65b *5/08, 35/38*
U.S. Cl. 53—26 **10 Claims**



A method and apparatus for packing whole fruit such as oranges in a carton wherein a mobile packing station is arranged to co-operate individually with any one of a plurality of feed stations each of which receives fruit of a particular grade. Each feed station is arranged to form the fruit into a particular layer formation corresponding to the layers required in the carton and to deliver this preformed layer of fruit to the packing station. The packing station then deposits the layer into a carton.

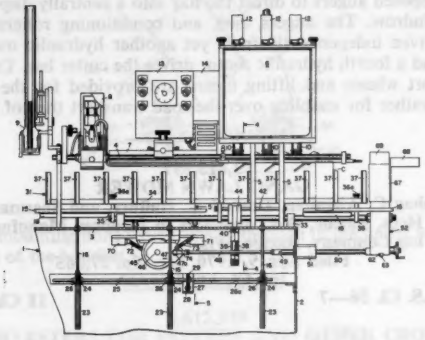
3,613,331
FEEDING MECHANISM FOR A CONTAINER FILLING MACHINE

Howard R. Garrett, St. Paul, Minn., assignor to Haskon, Inc., St. Paul, Minn.

Continuation-in-part of application Ser. No. 636,182, May 4, 1967. This application Mar. 28, 1969, Ser. No. 811,466
Int. Cl. B65b *3/04, 59/00*
U.S. Cl. 53—266 **5 Claims**

A feeding mechanism for advancing containers through a container filling and closing machine, comprising an endwise movable feed bar having feeding elements for

engaging the containers and advancing the same therewith, the feed bar being moved endwise by a rotary hydraulic motor having a throw of substantially one-half



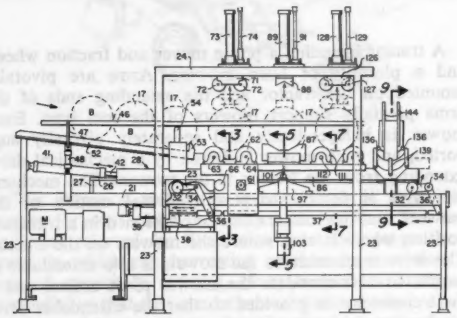
revolution whereby the containers are accelerated slowly at the beginning of the advance stroke and are decelerated slowly at the end of the advance stroke so that the containers are not upset or the contents splashed therefrom.

3,613,332

MACHINE FOR REMOVING BUNGS FROM KEGS

Henry J. Davis, Stockton, Calif., assignor to Automation International, Inc., Stockton, Calif.

Filed Mar. 5, 1970, Ser. No. 16,782
Int. Cl. B65b *43/40*
U.S. Cl. 53—381 A 6 Claims



A multi-station machine has a walking beam which moves a keg from a (1) receiving station to an (2) orienting station, where the bung is stopped in lowermost position, thence to a (3) debunging station where a rotating auger penetrates and removes the bung, then to a (4) sensing station where the presence of improperly conditioned kegs is determined, thence to a (5) discard station where improperly conditioned kegs are discarded from the line, and finally to a (6) discharge station where kegs with bungs removed are deposited for washing and filling in subsequent equipment.

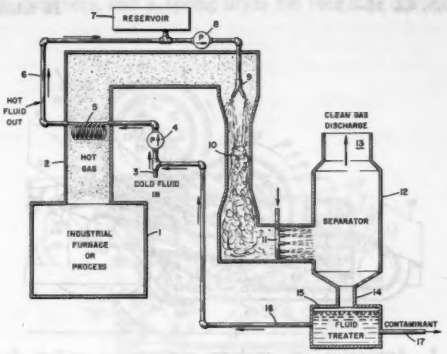
3,613,333

PROCESS AND APPARATUS FOR CLEANING AND PUMPING CONTAMINATED INDUSTRIAL GASES

Hugh E. Gardenier, P.O. Box 206, 903 Forrest Drive, Tullahoma, Tenn. 37388

Filed July 17, 1969, Ser. No. 842,635
Int. Cl. B01d *47/10*
U.S. Cl. 55—89 21 Claims

Process and apparatus for removing contaminants from and pumping a gas stream comprising indirectly heat exchanging the gas and a liquid, introducing the liquid under conditions of elevated temperature and pressure in



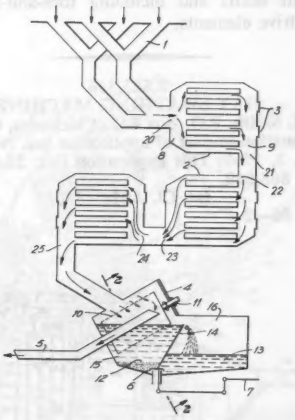
vaporized and atomized form into the gas, mixing same thereby entrapping the contaminants, and separating clean gas from the atomized liquid containing the contaminants.

3,613,334

APPARATUS FOR THE PURIFICATION OF WASTE GASES

Renzo Rafanelli, Via Maffia 13, Florence, Italy

Filed Apr. 9, 1969, Ser. No. 814,655
Claims priority, application Italy, Apr. 12, 1968, 833,982
Int. Cl. B01f *3/04*
U.S. Cl. 55—222 2 Claims

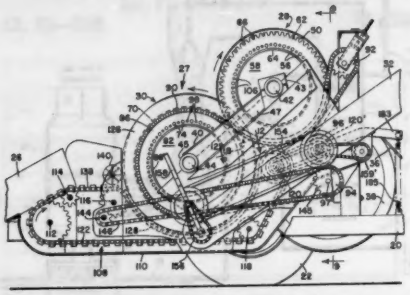


The waste gases of the combustion of a hydrocarbon fuel are passed along a path, in which the gases change direction, through a succession of heat exchangers until the gases exit from the last exchanger at about ambient temperature with the water vapor in the gases condensed, the gases then being passed to a filter where the condensed water and impurities are separated to leave a purified product which can now be discharged into the atmosphere. The condensed water and impurities are stored in a vessel which is periodically emptied.

3,613,335
MATERIAL COMPRESSING MACHINE

Murray W. Forth, Moline, Ill., assignor to Deere & Company, Moline, Ill.

Continuation-in-part of application Ser. No. 661, Jan. 5, 1960. This application Feb. 19, 1965, Ser. No. 434,138
Int. Cl. A01d 49/00
U.S. Cl. 56—1 16 Claims

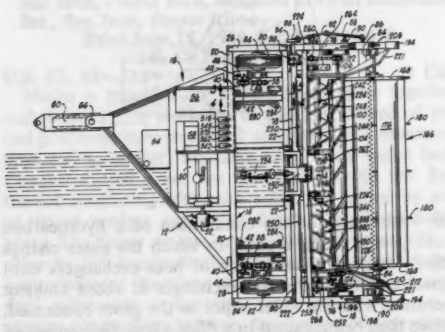


1. Apparatus for making compressed wafers from forage crops, comprising: a mobile frame having a longitudinal axis extending in the direction of travel of said frame, crop wafering means carried by the frame and including a plurality of die cells arranged in a circular series about a transverse horizontal axis and compression means rotatable about a transverse horizontal axis and cooperative with said cells to compress crops into and through said cells to form wafers, an input shaft journaled on a transverse horizontal axis and connected to and for driving said compression means, a power plant carried on the frame to the rear of and generally in longitudinal alinement with the wafering means and having an output shaft rotatable on a transverse horizontal axis, crop pick-up means carried by and projecting from a forward portion of the frame ahead of and generally in longitudinal alinement with the wafering means and having an input shaft rotatable on a transverse horizontal axis, and drive means connected among the output shaft and the two input shafts and including fore-and-aft extending flexible drive elements.

3,613,336
HAY SWATHING MACHINE

Loran M. Smith, P.O. Box 641, Chickasha, Okla. 73018

Continuation-in-part of application Ser. No. 606,797, Jan. 3, 1967. This application Oct. 22, 1969, Ser. No. 868,560
Int. Cl. A01d 43/08
U.S. Cl. 56—2 16 Claims

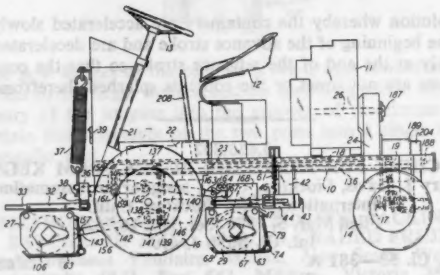


A self-propelled hay swather having hydraulic drive motors individually driving and controlling the ground engaging driving wheels. The hay swather includes a cutter bar at the forward end thereof, a reel rotatable to move the hay toward the cutter bar, with the reel being disposed in an elevated position above and forwardly of the cutter bar, a pair of conditioning rollers for partially crushing or breaking the stems of the hay, and cooperating, oppositely disposed augers to direct the hay into a centrally disposed windrow. The augers, reel, and conditioning rollers are driven independently from yet another hydraulic motor, and a fourth hydraulic motor drives the cutter bar. Transport wheels and lifting means are provided for the hay swather for enabling over-the-road transport thereof.

3,613,337
GANG LAWN MOWER

Sahag C. Akgulian, Donald G. Haffner, and Sherman C. Heth, Racine, Wis., assignors to Jacobsen Manufacturing Company, Racine, Wis.

Filed Apr. 9, 1970, Ser. No. 27,065
Int. Cl. A01d 75/30
U.S. Cl. 56—7 11 Claims



A tractor including a prime mover and traction wheels and a plurality of lawn mowers. Arms are pivotally mounted on the tractor and the extending ends of the arms pivotally support mowers of the reel type. Each mower is independently and separately pivotally supported, and each mower is driven by a mechanical drive extending from the tractor to the mowers. The mechanical drive is flexible to permit pivotal motion of the mowers, and the mowers can be positioned in a transport position where latches secure the mowers on the tractor. The drive mechanism to the mowers is also extendable in length, to accommodate the mower pivot action, and a limit connector is provided so that the extendable drive mechanism does not come apart upon maximum pivotal motion of the mowers relative to the tractor. A lift connector extends between two of the mowers such that lifting one of the mowers will also cause the other mower to be lifted, and lift springs are provided for assisting of lifting of the mowers and for also positioning the pivot arms in an optimum sturdy position with a minimum of play in the connection to the tractor. Abutment surfaces are provided on the tractor and the mowers for limiting the pivot of the mowers in both the mowing position and the transport position.

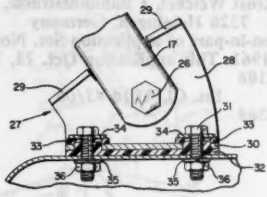
3,613,338
LAWN MOWER HANDLE MOUNTING ASSEMBLY

Clayton C. Furtaw, Baltimore, Md., assignor to The Black and Decker Manufacturing Company, Towson, Md.

Filed Oct. 1, 1969, Ser. No. 862,698
Int. Cl. A01d 35/26
U.S. Cl. 56—10.1 7 Claims

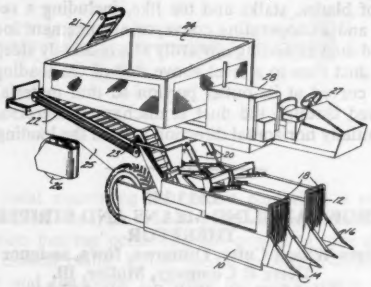
The handle of an electric mower is insulated from the housing of the mower by dielectric members which are located entirely on an upper surface of the housing. Spe-

cifically, dielectric insulators are provided which isolate the handle mounting brackets from the housing and from



the mounting bolts which extend through to the under surface of the housing.

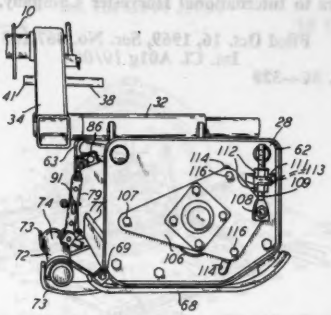
3,613,339
HARVESTERS FOR PEPPERS AND OTHER CROPS
Ernest Riggs, Las Cruces, N. Mex., assignor to New Mexico Chili Company, Las Cruces, N. Mex.
Filed June 23, 1969, Ser. No. 835,417
Int. Cl. A01d *45/22*
U.S. Cl. 56—130 **13 Claims**



This invention relates to improvements in crop harvesters for row crops including chili peppers. The embodiment selected for illustration is a chili pepper harvester in which the harvesting mechanism comprises a pair of oppositely rotating, elongate brushes arranged in parallel so that they can be moved forward relative to a row crop between them. Associated with each of the brushes, at the side away from the other brush, is a belt conveyor to carry away crop brushed from the crop plant. An elongate, rotating stripper bar is arranged in the path of movement of material from the brushes to the conveyor in position to be brushed by the bristles of the rotating brush. The stripper bar cooperates with a blade which extends along its length closely adjacent to its surface to shear and chop crop plant torn off by the brushes and cleaned from the brushes by the stripper bar. The machine incorporates provisions for elevating, including, and altering the separation between the brushes and their associated conveyors and stripper bars.

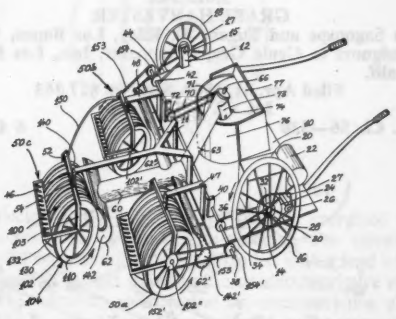
3,613,340
TRACTOR-DRIVEN LAWN MOWER
Sahag C. Akgulian, Donald G. Haffner, and Sherman C. Heth, Racine, Wis., assignors to Jacobsen Manufacturing Company, Racine, Wis.
Filed Apr. 9, 1970, Ser. No. 27,043
Int. Cl. A01d *55/20*
U.S. Cl. 56—249 **7 Claims**

A tractor-driven lawn mower including a tractor having an arm pivotally mounted thereon and having a mower pivotally supported on the extending end of the arm. The mower has two spaced-apart side members and a mower reel and a bed knife extending between the side members. The reel is adjustable toward and away from the bed knife. Conically shaped bearings support the reel on the side members, and a spring urges the reel in a direction



the same as the direction which the reel is urged in as its spiralled blades move in cutting rotation over the bed knife. A drive train extends from the tractor to the mower reel, and drive gears are included in the train and have a beveled gear which is on the reel shaft and urges the reel shaft in the same direction that the spring urges the shaft.

3,613,341
NUT HARVESTER
Sam B. Reeves, 2323 Cherry St., Montgomery, Ala. 36107
Filed Apr. 10, 1970, Ser. No. 27,315
Int. Cl. A01d *51/00*
U.S. Cl. 56—328 **9 Claims**



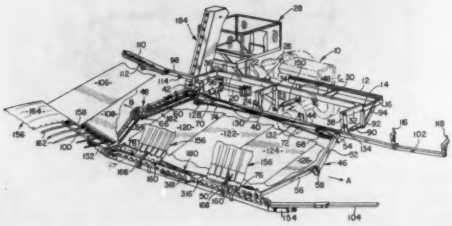
A nut harvester machine includes a carriage for advancing along a ground surface from which nuts are to be gathered. A conveyor is carried by the carriage to pass picked up nuts to a receptacle. A framework is mounted on the carriage. One or more nut gathering units are connected to the framework and conveyor to pick up nuts from the ground. Each unit includes an assembly of spaced tines which align nuts on the ground for engagement between laterally spaced flexible supported wheels. Other tines expel the nuts into a trough connected to the conveyor means. A motor on the carriage may be arranged to drive the carriage, nut gathering unit and conveyor.

3,613,342

FRUIT CATCHER AND CONVEYOR SYSTEM

Stuart D. Pool, Wheaton, Harold G. Meitl, Clarendon Hills, Calvin P. Rickerd, La Grange Park, and Tommy A. Middlesworth, Hinsdale, Ill., Jack B. Findlay, Mound, Minn., and Arlie J. Thayer, Tinley Park, Ill., and Edward Svereika, deceased, late of Chicago, Ill., by Mary J. Svereika, legal representative, Chicago, Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Oct. 16, 1969, Ser. No. 867,103
Int. Cl. A01g *19/06*
U.S. Cl. 56—329 17 Claims



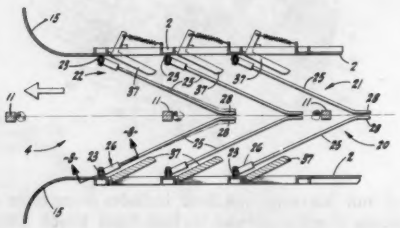
A self-propelled fruit harvester unit having a frame and a fruit-catching apron mounted for extension toward a tree to be harvested and retraction into a transport position. A conveyor on the frame collects fruit from the apron and conveys it to a foldable conveyor assembly which conveys it upwardly toward a collection point on the unit. The foldable conveyor assembly is mounted on the frame so as to pivot or fold as the frame is extended and retracted. Extension catcher assemblies and a gap closer apron are pivotally mounted on the frame and provide sloping surfaces for gravity feeding of fruit to the conveyor. Hydraulic means are operable to automatically stop the extension of the frame and to position the extension catcher assemblies and gap closer apron in response to engagement of the frame with a tree to be harvested.

3,613,343

GRAPE HARVESTER

Jean Sagouspe and Eugene D. Riley, Los Banos, Calif., assignors to Genie Grape Harvester, Inc., Los Banos, Calif.

Filed Apr. 21, 1969, Ser. No. 817,863
Int. Cl. A01g *19/60*
U.S. Cl. 56—330 6 Claims



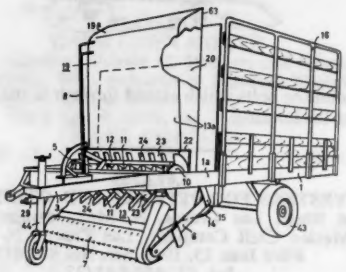
A grape harvester, for mechanically harvesting grapes from a row of vines trained on a post-supported above-ground wire, comprising a self-propelled mobile frame adapted to straddle and advance along the row of vines; the mobile frame being fitted with a power driven mechanism arranged to engage and shake the vines whereby to cause detachment of the grapes upon such advance of said frame, and the latter having thereon a detached-grape catching and conveying system.

3,613,344

SELF-LOADING VEHICLE FOR AGRICULTURAL BULK MATERIALS

Ernst Weichel, 1 Bahnhofstrasse, 7326 Heiningen, Germany

Continuation-in-part of application Ser. No. 115,208, June 6, 1961. This application Oct. 22, 1965, Ser. No. 501,108
Int. Cl. A01d *43/06*
U.S. Cl. 56—364 13 Claims



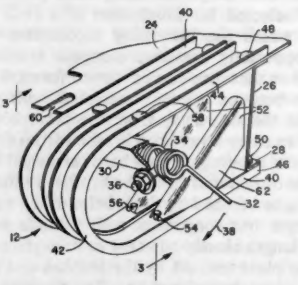
A self-loading vehicle for loading, transporting and unloading bulk agricultural materials, particularly in the form of blades, stalks and the like, including a receiving device and a cooperating conveyor arrangement including a closed duct extending upwardly at a relatively steep slope, which duct rises to a level above that of the loading space and is curved at its outlet portion so that material being conveyed through the duct is discharged therefrom in a substantially horizontal direction toward the loading space.

3,613,345

CROP-HANDLING MEANS AND STRIPPER THEREFOR

Larry Wilson Cofer, Ottumwa, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Sept. 30, 1969, Ser. No. 862,349
Int. Cl. A01d *89/00*
U.S. Cl. 56—364 4 Claims



A crop-handling device, especially for use as the crop pick-up for an agricultural machine and having improved crop strippers and reversible mounting means therefor.

3,613,346

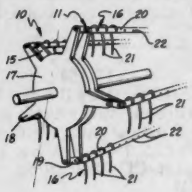
FINGER FOR A PICK-UP REEL

Stephen R. Hubbard, Stockton, Calif., assignor to Universal Harvester Co., Inc., Stockton, Calif.

Filed Aug. 25, 1969, Ser. No. 852,793
Int. Cl. A01d *57/02*
U.S. Cl. 56—400 8 Claims

A finger for a reel structure of the type used in swathers, combines, hay rakes, and like harvesting machinery to harvest grain and similar grass-like crops; and

of the type used in harrows, scarifiers, and like cultivating machinery to work or condition the ground. The finger is mountable upon a bat bar of such reel struc-



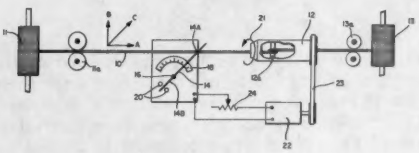
ture, and it comprises a long stem equipped at one end with an attachment element defining a stiff resilient clamp adapted to grip a bat bar and having lugs cooperative therewith to confine the finger thereon.

3,613,347

YARN TWIST MEASURING INSTRUMENT

George A. Carruthers, Havercroft, England, assignor to Turbo Machine Company, Lansdale, Pa.

Filed May 8, 1970, Ser. No. 35,675
Int. Cl. D01h *13/26*
U.S. Cl. 57—1 R 6 Claims



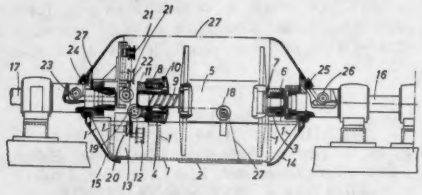
Yarn twist measuring instrument comprises a needle which rests on the yarn and is otherwise supported by a low friction bearing permitting the needle to turn freely in a horizontal plane. If the needle is counter-balanced, the yarn and the plane in which the needle turns need not be horizontal. As the yarn moves longitudinally and is rotated to produce twist or false twist, the needle assumes an angular disposition indicative of the amounts of twist being placed in the yarn.

3,613,348

FLYER SPINDLE FOR TWO-FOR-ONE TWISTING MACHINE

Guillermo Galceran Costa, Mongat, Spain, assignor to Maschinenfabrik Memmingen Espanola, S.A., Barcelona, Spain

Filed June 24, 1969, Ser. No. 836,124
Claims priority, application Spain, July 8, 1968, 356,165
Int. Cl. D01h *7/86*
U.S. Cl. 57—58.86 4 Claims



The invention provides a flyer spindle for a two-for-one twisting machine wherein the tension on the yarns being drawn off for twisting is self regulated by means of a mechanism including a tensioning roller.

3,613,349

TIME MEASURING AND DATE INDICATING DEVICE

Otto Horst Reinbold, Denzlingen, Germany, assignor to Blessing-Werke KG, Feinbau, Waldkirch im Breisgau, Germany

Filed Feb. 17, 1970, Ser. No. 12,077
Claims priority, application Germany, Feb. 21, 1969, G 69 06 772
Int. Cl. G04b *19/24*
U.S. Cl. 58—4 10 Claims

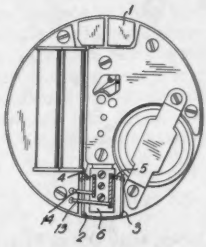
A clock is provided with a large ring concentric with the pointer axis and indicating the day of the month and a smaller overlapping eccentric disk indicating the names of the months which can be viewed through windows in the dial arranged along a line passing through the axis of the pointers.

3,613,350

ELECTRIC TIMEPIECE

Kikuo Kurino, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Mar. 12, 1970, Ser. No. 18,989
Claims priority, application Japan, Mar. 4, 1969, 44/22,326
Int. Cl. G04c *3/00*
U.S. Cl. 58—23 TF 3 Claims



An electric timepiece having a vibrator energized by a piezoelectric or electrostrictive element. The vibrator is mounted on a terminal board provided with a lead wire for connection to said piezoelectric or electrostrictive element. The vibrator, piezoelectric or electrostrictive element, and terminal board are adapted to be mounted on the main plate of the timepiece or removed therefrom as a unit.

3,613,351

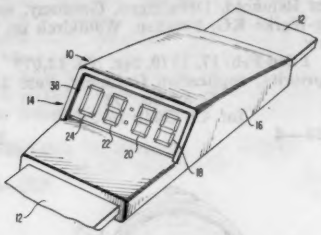
WRISTWATCH WITH LIQUID CRYSTAL DISPLAY

Richard S. Walton, Lancaster, Pa., assignor to Hamilton Watch Company, Lancaster, Pa.

Filed May 13, 1969, Ser. No. 824,148
Int. Cl. G04b *19/30*
U.S. Cl. 58—23 9 Claims

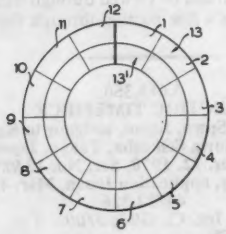
Disclosed is a liquid crystal display and power supply system particularly suited for a wristwatch. A bar segment digital display is subjected to an electric field to energize selected portions of the display in accordance

with the output of a timekeeping source within the watch. The display is separately powered either from solar cells



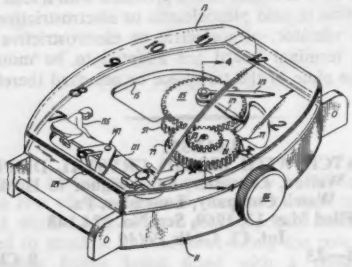
or from a piezoelectric transducer actuated by watch movement.

3,613,352
INDICATING DEVICE
Werner Giersiepen, Am Freudenberg 59, Wuppertal-Elberfeld, Germany
Filed June 9, 1969, Ser. No. 831,785
Int. Cl. G04b *19/30*
U.S. Cl. 58—50 **28 Claims**



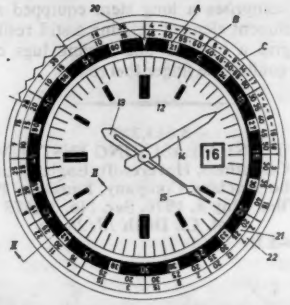
An indicating device has a dial provided with an exposed surface. Marking means subdivides the dial and provides it with a first series of identical surface portions each of which is representative of a predetermined number of minutes, and a second series of identical surface portions each representative of a predetermined number of hours. Illuminating means sequentially illuminates at least one surface portion each of the first and second series for providing an indication of elapsed time.

3,613,353
WATCH
Bruce A. Kock, 6017 Ocean View Drive, Oakland, Calif. 94618
Filed May 3, 1968, Ser. No. 726,347
Int. Cl. G04b *33/00*
U.S. Cl. 58—59 **14 Claims**



A shock resistant watch of relatively few parts and consequent inexpensive construction employing a dumbbell balance freely pivoted on a staff with the only connection between the balance and the staff being a leaf spring. The entire gear train of the watch is arranged on two shafts and the minute and hour hands are both driven directly by an intermediate wheel. The entire watch is assembled without screws, nuts or bolts.

3,613,354
RIM FOR A DIVER'S WATCH
Werner Jenny, Lengnau, Switzerland, assignor to Jenny et Cie S.A., Lengnau, Switzerland
Filed May 15, 1969, Ser. No. 824,940
Int. Cl. G04b *19/00*
U.S. Cl. 58—126 R **4 Claims**



A rim for a diver's watch comprising three concentric annular zones bearing indications concerning respectively the depth of immersion, the time interval of immersion and the corresponding decompression time interval to be observed by a diver before returning to the surface of the water.

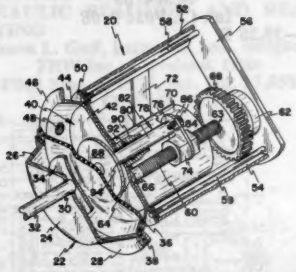
3,613,355
CONNECTOR DEVICES
Roger L. Gower, 21 Coburn Ave., Skowhegan, Maine
Filed June 30, 1969, Ser. No. 837,521
Int. Cl. F16g *15/00*
U.S. Cl. 59—93 **2 Claims**

This disclosure relates to connector devices for chain and cable assemblies, combining ease of assembly and disassembly with minimal possibility of accidental disassembly.

3,613,356
AUXILIARY BRAKING SYSTEM
Heber Jay Woodward, Salt Lake City, Utah, assignor to Index Industries, Inc., Salt Lake City, Utah
Filed Aug. 4, 1969, Ser. No. 847,278
Int. Cl. F01b *21/00*
U.S. Cl. 60—6 **3 Claims**

Method and apparatus for applying brakes, the apparatus including an electrically driven displaceable plunger situated so as to oppose the actuating rod of an air brake system and, when the plunger is advanced into

engagement with the actuating rod, the brakes of a vehicle will be applied independent of the presence of pressurized air. In another embodiment, a hydraulic fluid master cylinder is provided with a float which indicates the amount of fluid in the master cylinder reservoir. An



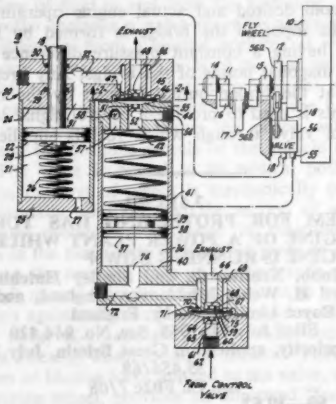
electrically driven rod advances or retracts a wedge nut having opposed ramp surfaces so that the spacing between push arms, attached to the brake shoes of a hydraulic braking system, is varied between a fully applied and a fully released braking condition.

3,613,357

NON-REPEAT CONTROL APPARATUS FOR POWER MACHINERY

Clinton E. Withington, 21233 Gribben Ave., Hayward, Calif. 94541

Filed July 10, 1969, Ser. No. 840,666
Int. Cl. F15b *5/00, 11/16, 15/22*
U.S. Cl. 60—10.5 **8 Claims**



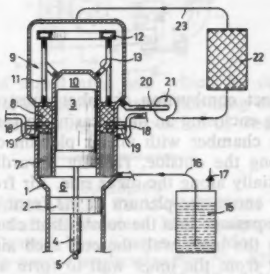
Non-repeat control apparatus for cyclically operative power machinery. Power machinery having a cyclically repetitive mode of operation such as punch presses perform one complete cycle of operation in response to manual initiation thereof. Control apparatus embodying the invention is effective to prevent inadvertent or repetitive cyclic operation of such machinery following any initiation of such cycle. The apparatus includes control mechanism comprising a cylinder having a piston reciprocable therein which is connected with the operating lever of the machinery to displace the same and thereby cause its operation. The control mechanism is actuated by energizing mechanism also comprised of a cylinder having a piston reciprocable therein. Whenever the piston of the energizing cylinder is displaced, a charge of compressed air is expressed into the control cylinder to displace the piston thereof into its machinery-actuating position. Exhaust means associated with the two cylinders dissipates any such charge of air after utilization by the control mechanism and also prevents delivery of a subsequent charge thereto until a cycle of operation of the power machinery has been completed.

3,613,358

DEVICE FOR CONVERTING CALORIFIC ENERGY INTO MECHANICAL ENERGY

Roelf Jan Meijer, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 19, 1968, Ser. No. 777,087
Claims priority, application Netherlands, Dec. 19, 1967, 6717268
Int. Cl. F02g *1/00*
U.S. Cl. 60—24 **3 Claims**



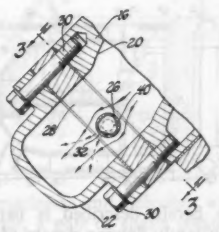
A hot-gas engine having additional means for selectively supplying thermal energy above ambient temperature to the heater and for withdrawing thermal energy below ambient temperature from the cooler.

3,613,359

ASPIRATED EXHAUST SYSTEM

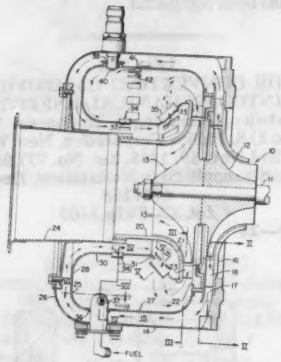
Raymond C. Posh, Livonia, and William T. Downs, Howell, Mich., assignors to Lear Siegler, Inc., Santa Monica, Calif.

Filed Jan. 15, 1970, Ser. No. 3,157
Int. Cl. F01n *3/10*
U.S. Cl. 60—30 **9 Claims**



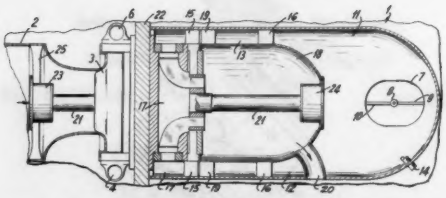
An air aspirating device in the form of a tubular member which is disposed in the exhaust gas passage adjacent the exhaust valve and equipped with a check valve to aspirate ambient air into the exhaust stream thereby to promote continuing exhaust gas combustion after removal from the combustion chamber. The air aspirating device may be installed in the head assembly of the engine or in the exhaust manifold or in an adaptor member which is to be disposed between the head assembly and the exhaust manifold.

3,613,360
COMBUSTION CHAMBER CONSTRUCTION
Leslie D. Howes, Phoenix, Ariz., assignor to The Garrett Corporation, Los Angeles, Calif.
Filed Oct. 30, 1969, Ser. No. 872,628
Int. Cl. F02c 3/08; F23r 1/10
U.S. Cl. 60—39.36 12 Claims



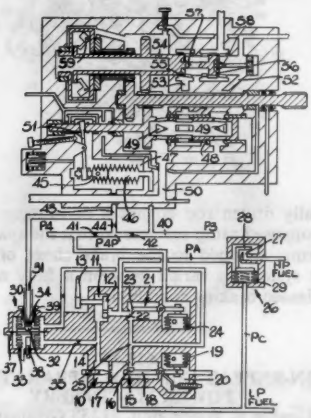
The subject combustion chamber construction has an outer casing enclosing an inner casing to form an annular combustion chamber with an air plenum or passage extending along the outside, radially inwardly at the rear end, and axially along the inner side. Air from the engine compressor enters the plenum at the front end and flows through the passage into the combustion chamber through openings in the inner wall thereof, such air then flowing tangentially from the inner wall to form a toroidal flow pattern. Fuel is sprayed into combustion chamber from tangentially directed jets to mix and burn with the air in the toroidal flow pattern, the resulting gases discharging from the chamber via an annular radially inwardly directed nozzle adjacent the air inlet. The toroidal flow pattern in the annular chamber prolongs the air/fuel mixing and burning period.

3,613,361
TURBO-COMPRESSOR ENGINE
Frank Rifkin, Roselle, N.J., assignor to Turbo-Compressor Engine Corp.
Filed July 1, 1969, Ser. No. 838,103
Int. Cl. F02c 7/00; F02k 3/02
U.S. Cl. 60—39.41 9 Claims



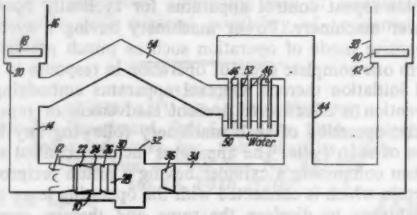
The engine herein described is particularly adapted to create a constantly flowing stream of pressurized gases and generally includes the serial alignment along a common shaft of a first compressor, a second compressor and a turbine. The initial body of air entering the engine is compressed by the first compressor and divided. A portion of the air is directed to the main exhaust or accumulating tank of the engine with the other portion mixed with fuel and ignited. The combustion gases drive the turbine and are further compressed downstream of the turbine by the second compressor. The recompressed exhaust is then recombined with the initially divided first portion of air in the exhaust or accumulating tank.

3,613,362
GAS TURBINE FUEL CONTROL SYSTEMS
Trevor Stanley Smith, Birmingham, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England
Filed Sept. 17, 1969, Ser. No. 858,763
Claims priority, application Great Britain, Sept. 20, 1968, 44,804/68
Int. Cl. F02c 9/08
U.S. Cl. 60—39.28 R 18 Claims



A fuel control system for a gas turbine engine comprises an hydraulic bridge circuit, a flow restrictor being included in each arm of the bridge and three of the restrictors being variable in accordance with signals obtained from desired and actual engine operating conditions. The input to the bridge is formed by fuel connections having a constant pressure difference and applied at diagonal points of the bridge. Any pressure difference at the bridge output formed by the remaining two points is used to provide a control signal to actuate a control valve through which fuel is supplied to the engine.

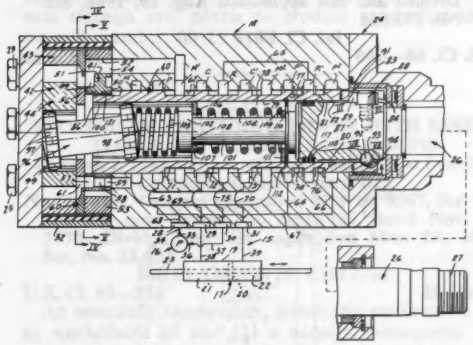
3,613,363
SYSTEM FOR PROTECTING GAS TURBINE ENGINE OF A POWER PLANT WHILE THE ENGINE IS RUNNING DOWN
Albert Jubb, Kenilworth, and Stanley Hutchinson and Richard H. Webb, Mickleover, England, assignors to Rolls-Royce Limited, Derby, England
Filed July 24, 1969, Ser. No. 844,420
Claims priority, application Great Britain, July 25, 1968, 35,456/68
Int. Cl. F02c 7/08
U.S. Cl. 60—39.52 6 Claims



The invention comprises a gas turbine engine power plant having a rapid shutdown facility. The air inlet can

be rapidly closed, and the exhaust gases are then diverted, cooled and recirculated through the engine to permit it to run down to rest without stalling.

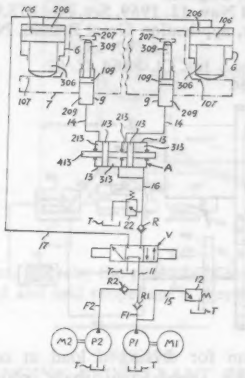
3,613,364
HYDROSTATIC STEERING SYSTEM WITH HYDRAULIC REACTION AND REACTION LIMITING
Raymon L. Goff, Lafayette, Ind., assignor to TRW Inc., Cleveland, Ohio
Filed Mar. 6, 1970, Ser. No. 17,058
Int. Cl. F15b *15/18*
U.S. Cl. 60—52 S **17 Claims**



A vehicular hydrostatic power steering system including a main power fluid pump, a double-acting hydraulic cylinder and a one-piece hydraulic controller for controlling the flow of fluid to and from the hydraulic cylinder. The controller includes a valve movable alternatively in opposite directions from a neutral position, at which the fluid pressure at the opposite ends of the hydraulic cylinder is balanced, to a pair of operating positions, at which the fluid pressure at the opposite ends of the hydraulic cylinder is unbalanced to move the piston within the cylinder and the dirigible wheels of the vehicle attached thereto. The valve is biased to its neutral position by two forces, the first of which is mechanically produced and substantially constant and the second of which is hydraulically produced and varies in magnitude with variations in the magnitude of the fluid pressure differential between the opposite ends of the hydraulic cylinder. The valve is moved from its neutral position to its operating position against the mechanical and hydraulic biasing forces by virtue of an operating shaft which, conventionally, has a steering wheel mounted thereon. The hydraulic reaction or biasing force applied to the valve, and thus to the steering wheel, provides an improved "feel of the road" for the operator of the vehicle.

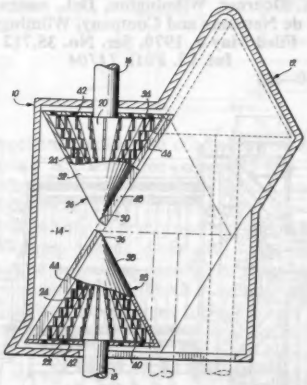
3,613,365
HYDRAULIC DRIVING DEVICE FOR BENDING PRESSES
Giuseppe Costa, Genoa, Italy, assignor to Verrina S.p.A., Genova-Voltri, Italy
Filed Mar. 25, 1970, Ser. No. 22,605
Claims priority, application Italy, Mar. 29, 1969, 6,913/69
Int. Cl. F15b *11/22*
U.S. Cl. 60—52 HP **10 Claims**

The hydraulic system for a hydraulic driving device of a bending press includes two hydraulic control cylinders which co-operate with the upper jaw to effect vertical reciprocation of the upper jaw between guides therefor. The invention provides for the inclusion in the hydraulic system of compensating cylinders associated with the control cylinders and housing pistons having opera-



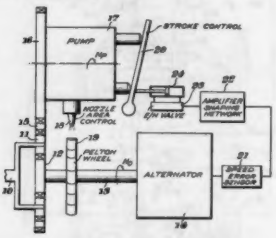
tive surface of equal area and which by co-operation with the control cylinders prevent jamming of the upper jaw in the guides during reciprocation of the upper jaw.

3,613,366
HYDRAULIC TRANSMISSION
Harold L. Cottrell, Grandview, Mo., assignor to Power Control, Inc., Kansas City, Mo.
Continuation-in-part of application Ser. No. 628,228, Mar. 29, 1967, now Patent No. 3,455,110, dated July 15, 1969. This application July 7, 1969, Ser. No. 839,158
Int. Cl. F16d *33/04;* **F16h** *41/00*
U.S. Cl. 60—54 **5 Claims**



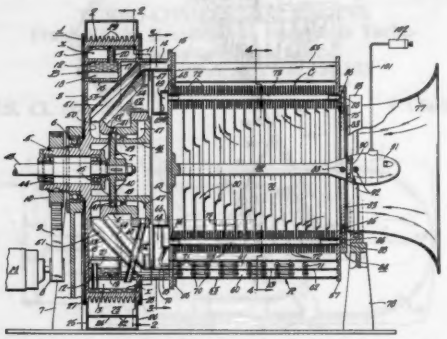
A hydraulic transmission unit including, within a sealed, fluid filled container, a pair of shafts rotatably mounted in the container and extending therefrom, a conical impeller on one of the shafts and a conical turbine on the other shaft, the shafts being relatively shiftable from an initial position in axial alignment to a position wherein the impeller and the turbine are in closer proximity than in the initial position. In one form of the invention the impeller and turbine are each provided with a perforate casing whereby to direct the fluid flow therebetween in the most efficient manner; and in the other form, the impeller is in the nature of a conical male impeller, the turbine being in the form of a conical female unit.

3,613,367
CONSTANT SPEED DRIVE
Charles Philip Smith and John Roger Wynne, Wolverhampton, England, assignors to H. M. Hobson Limited, London, England
Filed Nov. 12, 1969, Ser. No. 875,948
Claims priority, application Great Britain, Nov. 12, 1968, 53,597/68
Int. Cl. F16d 31/02
U.S. Cl. 60—54 4 Claims



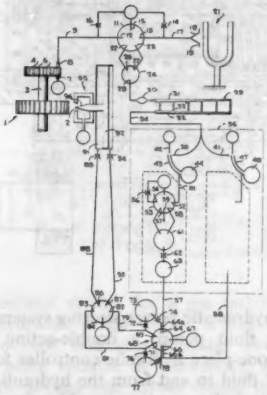
A mechanism for driving a load at constant speed from a variable speed input shaft, which comprises epicyclic gearing including a member driven by the input shaft, a member driving an output shaft connected to the load and a reaction member, a variable delivery hydraulic pump connected to be driven by the reaction member and having a pintle nozzle which adjusts its area automatically in the sense to maintain the delivery pressure of the pump substantially constant, a pelton wheel on the output shaft driven by liquid discharged by the nozzle, mechanism for sensing the rotational speed of the output shaft and means controlled by the sensing mechanism for controlling the delivery of the pump in the sense to maintain the rotational speed of the output shaft at a constant level.

3,613,368
ROTARY HEAT ENGINE
William A. Doerner, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
Filed May 8, 1970, Ser. No. 35,712
Int. Cl. F01k 11/04
U.S. Cl. 60—95 18 Claims



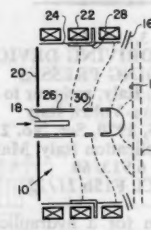
A closed cycle Rankine rotary engine comprising a boiler, expander and condenser. The boiler is of annular configuration and is rotationally driven about its axis at predetermined speed to maintain in the boiler an annular body of liquid having an inner surface level spaced a predetermined distance radially outward from the rotation axis. The condenser is mounted coaxially adjacent the boiler to rotate therewith as a unit and comprises an array of annular radial fins having axial heat exchange tubes extending therethrough in which the exhaust vapor from the expander is condensed by heat exchange with a cooling fluid discharged outwardly between said fins. The condenser heat exchange tubes are spaced radially outward from the rotation axis a predetermined distance less than the boiler liquid inner surface level and the spacings of said liquid surface level and heat exchange tubes are correlated with respect to each other and the rotational speed of the boiler to provide the required radial distance between the tubes and liquid surface necessary to produce the boiler liquid pressure required to maintain the desired boiler vapor pressure at said speed of rotation.

3,613,369
TURBINE SPEED CONTROL
John R. Colston, Monroeville, Pa., assignor to Bowles Fluidic Corporation, Silver Spring, Md.
Original application July 5, 1963, Ser. No. 293,108. Divided and this application Aug. 19, 1966, Ser. No. 573,661
Int. Cl. F01k 13/00
U.S. Cl. 60—105 21 Claims



A fluid control system generates a first fluid signal having a frequency component which varies as a function of a parameter of a device to be controlled, and a second fluid signal having a fixed frequency, the fluid signals are combined to produce a further fluid signal whose frequency varies as a function of deviation of the parameter from a predetermined condition, and a detector for genenerating a fluid signal having an amplitude and sense which is a function of said further fluid signal and an output device to maintain the further signal at a prescribed frequency.

3,613,370
ION THRUSTER
T. O. Paine, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Wolfgang Knauer, Malibu, and Robert L. Poeschel, Los Angeles, Calif.
Filed Nov. 26, 1969, Ser. No. 880,246
Int. Cl. F03h 1/00; F04b 37/02; F05h 1/04
U.S. Cl. 60—202 11 Claims



Improving the efficiency of an ion thruster by utilizing a radial magnetic field to achieve uniformity in electron density and energy.

3,613,371

HYPERGOLIC BIPROPELLANT PROPULSION PROCESS USING BORON COMPONENTS

Lawrence J. Edwards, Zelienople, Pa., assignor to Callery Chemical Company, Pittsburgh, Pa.

No Drawing. Filed Feb. 4, 1959, Ser. No. 791,231
Int. Cl. C06d *5/00, 5/06*
U.S. Cl. 60—214 9 Claims

1. The method of developing a thrust which comprises reacting a borane component selected from the group consisting of boron hydrides, hydrocarbon substituted boron hydrides, and mixtures thereof, and a hydrazine component selected from the group consisting of hydrazine, hydrocarbon substituted hydrazines, and mixtures thereof, in a chamber which is closed except for a constricted exhaust nozzle, and expelling the resultant reaction products through said nozzle to produce a reaction thrust on said chamber.

3,613,372

METHOD OF PROVIDING POWER WITH ESSENTIALLY NONAQUEOUS EMULSIONS

Kenneth J. Lissant, St. Louis, Mo., assignor to Petrolite Corporation, Wilmington, Del.

No Drawing. Original application May 10, 1967, Ser. No. 637,332, now Patent No. 3,539,406, dated Nov. 10, 1970. Divided and this application Mar. 23, 1970, Ser. No. 22,052
Int. Cl. C06d *5/10*; C10l *7/02*
U.S. Cl. 60—216 10 Claims

An essentially nonaqueous, thixotropic emulsion of (1) an emulsifiable oil and (2) a nonoily, nonaqueous material, the emulsion containing in the internal phase at least 80% oil by volume of the total emulsions; methods of preparing the emulsion; and uses therefor, particularly as fuels, including their use as a source of power in engines normally capable of burning the oil phase, such as in jet, rocket, diesel, etc., engines including fuel injection engines, such as an internal combustion engine, for example employed in landcraft, watercraft, aircraft, etc.

3,613,373

HYBRID HIGH ENERGY PROPULSION METHOD

Martin H. Kaufman, China Lake, Calif., assignor to the United States of America as represented by the Secretary of the Navy

No Drawing. Filed Mar. 13, 1964, Ser. No. 352,432
Int. Cl. C06d *5/10*
U.S. Cl. 60—219 6 Claims

1. A solid fuel comprising the following constituents:

Constituent:	Percent by weight
Hydrazine gel	40–70
Zirconium	30–60

said hydrazine gel consisting essentially of about 1% by weight aluminum acetate, 9% by weight sodium alginate, and 90% by weight hydrazine.

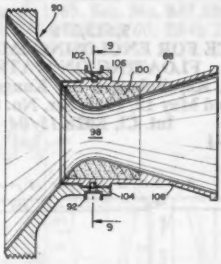
3,613,374

THRUST-TERMINATION NOZZLE FOR A SOLID-PROPELLANT ROCKET ENGINE

Harold W. Ritchey, Huntsville, Ala., assignor to Thiokol Chemical Corporation, Trenton, N.J.

Filed June 24, 1958, Ser. No. 745,237
Int. Cl. C06d *5/00*
U.S. Cl. 60—219 1 Claim

1. The method of terminating, in flight, the thrust generated by the burning of a solid propellant charge in a rocket engine comprising a casing terminating in rearward portions in a constricted throat and having a detachable nozzle of cross-sectional area smaller than the constricted throat of said casing, said detachable nozzle being positioned within said throat, which method comprises detaching said nozzle from said casing while said propellant is burning, thus suddenly increasing the area for



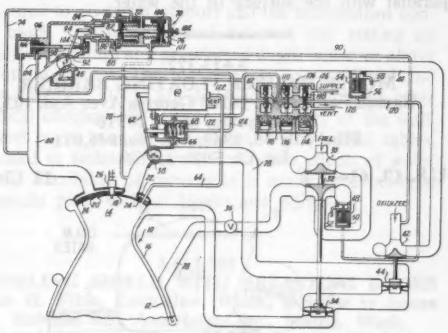
escaping gases, whereby the pressure in said casing is suddenly reduced and said propellant is thereby extinguished.

3,613,375

ROCKET ENGINE PROPELLANT FEEDING AND CONTROL SYSTEM

Robert N. Abild, New Britain, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

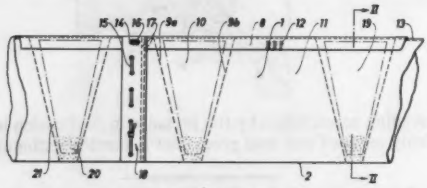
Filed June 5, 1961, Ser. No. 114,791
Int. Cl. F02k *3/00*
U.S. Cl. 60—240 14 Claims



1. A propellant feeding and control system for a rocket engine having a combustion chamber and a reaction nozzle surrounded by a vaporizing jacket, and fuel and oxidizer injectors to supply propellants to the combustion chamber, comprising: a first propellant supply line including a first pump means connected with said fuel injector; a second propellant supply line including a second pump means connected with said oxidizer injector; one of said propellant supply lines including said vaporizing jacket; turbine means drivingly connected with said first and said second pump means, and being disposed in said propellant supply line which includes the vaporizing jacket, between said vaporizing jacket and the injector, in said propellant supply line, whereby said turbine means and said pump means are driven by vaporized propellant; at least the pump means connected with said vaporizing jacket supplying a cryogenic propellant; a first control valve movable to a propellant flow cut-off position in said first supply line adjacent said fuel injector; a second control valve movable to a propellant flow cut-off position in said second supply line adjacent said oxidizer injector; and a trap valve, movable to a propellant flow cut-off position, in said propellant supply line including the vaporizing jacket, said trap valve and said control valves being disposed downstream from the pump means in their respective supply lines, and the vaporizing jacket and turbine means being disposed between the trap valve and a control valve, whereby cryogenic propellant in said

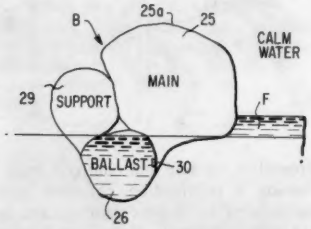
supply line between said trap valve and said control valve therein, when said valves are closed, is in a vaporized state.

3,613,376
FENCE FOR ENCLOSING IMPURITIES FLOATING ON WATER
Bo Midby, Kaprifolvagen 31, Kungsbacka, Sweden
Filed May 12, 1969, Ser. No. 823,604
Int. Cl. E02b *15/04*
U.S. Cl. 61—1 **6 Claims**



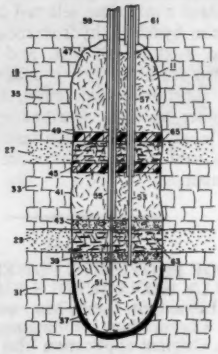
A fence for enclosing impurities floating on water, having an elongated two layer piece of material with spaced apart pockets provided by connections to the two layers of material which pockets have openings facing one longitudinal edge of the material and floats and weights in said pockets capable of keeping the fence floating in water with the sides of the fence substantially vertical and the longitudinal edges of the fence substantially parallel with the surface of the water.

3,613,377
MULTICHAMBER FLOATING BARRIER
Ramon Earl Zaugg, 14223 Georgia Ave., Apt. 103, Silver Spring, Md. 20910
Filed July 30, 1969, Ser. No. 846,071
Int. Cl. E02b *15/04*
U.S. Cl. 61—1 F **11 Claims**



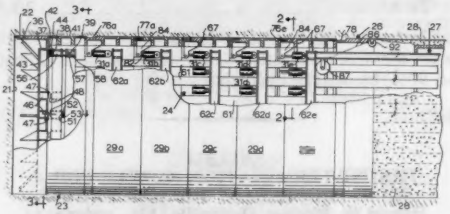
A multiple-chamber barrier of flexibile material adapted to float near the surface of a liquid and confine to a restricted area thereof buoyant materials floating on that surface. The barrier is particularly useful in connection with the present illustrative example for confining buoyant materials such as oil floating on the surface of a body of water, especially during adverse weather or sea conditions when wave activity is high and wind tends to spread the floating material rapidly away from its source, i.e. an oil leak. The present barrier comprises multiple chambers joined to form, when floating, a triangular cluster of flexible bag-like tubes including a ballast chamber partly filled with water and virtually immersed beneath the other chambers so that it lies mostly submerged, a main chamber partially inflated with air and rising above the water surface like a large continuous pillow, and a support chamber more firmly inflated with air and lying above the top of the ballast chamber and behind the main air chamber to help support the latter when the wind tries to beat it flat on the water surface. The invention includes means for manipulating the ends of the chambers including inflating and sealing them, and means for storing and reeling out the barrier to whatever length of it is required under actual working conditions.

3,613,378
UNDERGROUND STORAGE
Henry F. Dunlap and Robert Wilson, Dallas, Tex., assignors to Atlantic Richfield Company, Philadelphia, Pa.
Filed Nov. 13, 1967, Ser. No. 682,114
Int. Cl. B65g *5/00*
U.S. Cl. 61—.5 **20 Claims**



Underground storage comprised of a conduit system extending into one or more storage sections of a large, vertically extended volume of void spaces and rock rubble, such as a chimney created by a subsurface nuclear explosion. Each storage section traverses an impermeable formation and is separated from a more permeable nonstorage section by one or more lateral impermeable barriers at least partially composed of a time-setting material which has set. The barriers may be formed by injecting enough flowable, time-setting barrier material lighter than a heavier liquid in the volume to form a floating layer over the heavier liquid which was previously located or located and adjusted to a predetermined level which separates impermeable from permeable zones. A controlled fluid loss material may be placed opposite permeable zones.

3,613,379
METHOD FOR ADVANCING TUNNEL SUPPORTS
Joseph Donovan Jacobs, San Rafael, Calif. (% Jacobs Associates, 500 Sansome St., San Francisco, Calif. 94111)
Continuation-in-part of application Ser. No. 798,097, Feb. 10, 1969. This application June 25, 1969, Ser. No. 836,546
Int. Cl. E01g *3/00*
U.S. Cl. 61—42 **11 Claims**



Apparatus and method for continuously or intermittently advancing tunnel supports against surrounding earth pressure. Cutting edge and trailing shells are interconnected by a longitudinal frame or cage structure. Intermediate the forward and trailing shell are overlapping intermediate shells which are individually connected to the cage structure by hydraulic cylinders so that each intermediate shell can be moved longitudinally relative to the others and relative to the tunnel wall while the other intermediate shells engage the tunnel wall and advance the

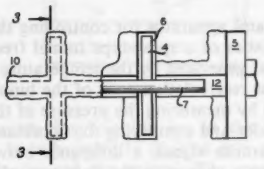
cage as well as the forward or support and trailing shells. The intermediate shells are sequentially moved forwardly, preferably by releasing the pressure exerted against the wall, as by contracting the shell or by projecting through the shell various-shaped devices which grip or penetrate the wall. The support may incorporate steering guidance means for adjusting the direction of the excavation device about perpendicular transverse axes. Means is also provided on the trailing shell for feeding out the rearward end ribbons, or rods to support the tunnel walls prior to concreting and also a retainer shell which functions as a screed for the concrete and supports the concrete as it is gaining strength.

3,613,380

METHOD OF SUPPORTING WARM PIPELINE IN ARCTIC REGION

Jack Tarner, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed June 18, 1969, Ser. No. 834,442
Int. Cl. E02d *27/36, 27/46;* **F16l** *1/00*
U.S. Cl. 61—46 **9 Claims**



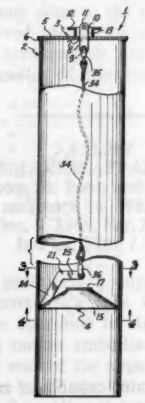
A stable pipeline in permafrost areas is achieved by laying pipe on spaced supports extending away from the pipeline and into the solidly frozen permafrost so as to prevent sinking of the pipeline into a thawed zone produced by heat leakage from warm fluid carried in the pipeline.

3,613,381

OFFSHORE STRUCTURES AND THEIR INSTALLATION

Dwight J. Cox, New Orleans, La., assignor to J. Ray McDermott & Co., Inc., New Orleans, La.

Filed June 22, 1970, Ser. No. 48,060
Int. Cl. E02b *17/02;* **E02d** *23/02*
U.S. Cl. 61—46.5 **19 Claims**



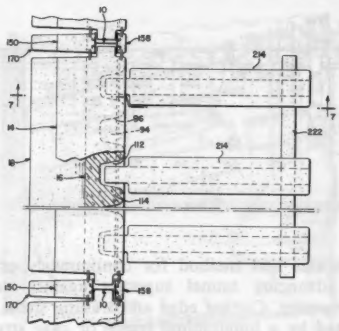
Jacket columns for offshore structures, rendered initially buoyant by removable upper and lower closure members, are installed by being upended and the lower closure member is then completely removed by tearing it away from the surrounding jacket column wall and withdrawing the torn remains upwardly through the jacket column.

3,613,382

SEA WALL CONSTRUCTION

Bryan J. Dickinson, Des Moines, Wash., assignor to West Construction Enterprises, Inc., Des Moines, Wash.

Filed Aug. 6, 1969, Ser. No. 847,886
Int. Cl. E02b *3/08;* **E02d** *5/00;* **E04b** *2/08*
U.S. Cl. 61—49 **31 Claims**



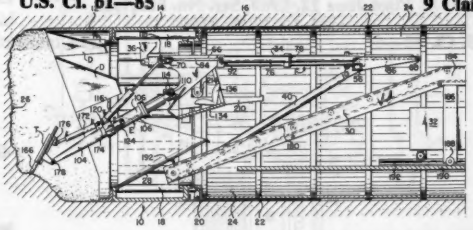
Modular sea wall structure utilizing steel beam bearing pilings between and on which are supported modular concrete block units. The pilings are driven as deeply as required to give firm support and the bottommost concrete block unit is positioned between and resting on two adjacent pilings at a preselected depth below or above the bottom surface. The top block is post-tensioned and the intermediate blocks are designed along with the other structural components to hold the geometry of the wall. All steel parts, namely, pilings and pretensioned cables, are sealed or isolated from the corrosive effects of water and air. Flexibility of movement is maintained between component parts such as blocks and pilings.

3,613,383

TUNNELING SHIELD WITH BREASTING DOORS

Tyman H. Fikse, Enumclaw, Wash., assignor to James S. Robbins and Associates, Inc., Seattle, Wash.

Original application Dec. 10, 1968, Ser. No. 782,567. Divided and this application July 9, 1970, Ser. No. 53,400
Int. Cl. E01g *3/03*
U.S. Cl. 61—85 **9 Claims**

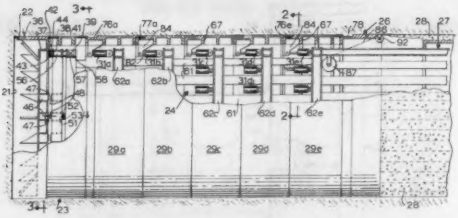


The shield has a tubular skin. The radially outer edges of a plurality of breasting doors are hinge connected to the skin adjacent its forward edge. Each door is equipped with an independently controllable hydraulic actuator which is pivotally connected at its forward end to a rearward intermediate part of the door and at its rear end to a location on the shield skin spaced axially rearwardly of the hinge means. The doors both alone and in combination with a rearwardly inclining mined material ramp serve to support the tunnel face.

3,613,384
METHOD AND APPARATUS FOR ADVANCING TUNNEL SUPPORTS

J. Donovan Jacobs, San Rafael, Calif. (% Jacobs Associates, 500 Sansome St., San Francisco, Calif. 94111)

Filed Feb. 10, 1969, Ser. No. 798,097
Int. Cl. E01g 3/00
U.S. Cl. 61—85 16 Claims

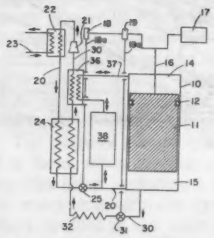


Apparatus and method for continuously or intermittently advancing tunnel supports against surrounding earth pressure. Cutting edge and trailing shells are interconnected by a longitudinal frame or cage structure. Intermediate the forward and trailing shell are overlapping intermediate shells which are individually connected to the cage structure by hydraulic cylinders so that each intermediate shell can be moved longitudinally relative to the others and relative to the tunnel wall while the other intermediate shells engage the tunnel wall and advance the cage as well as the forward or support and trailing shells. The intermediate shells are sequentially moved forwardly, preferably by releasing the pressure exerted against the wall, as by contracting the shell. The support may incorporate steering guidance means for adjusting the direction of the excavation device about perpendicular transverse axes. Means is also provided on the trailing shell for feeding out the rearward end wires or rods to support the tunnel walls prior to concreting and also a retainer shell which functions as a screed for the concrete and supports the concrete as it is gaining strength.

3,613,385
CRYOGENIC CYCLE AND APPARATUS

Walter H. Hogan, Wayland, and Robert W. Stuart, Wakefield, Mass., assignors to Cryogenic Technology, Inc., Waltham, Mass.

Filed June 12, 1969, Ser. No. 832,752
Int. Cl. F25b 9/00
U.S. Cl. 62—6 29 Claims

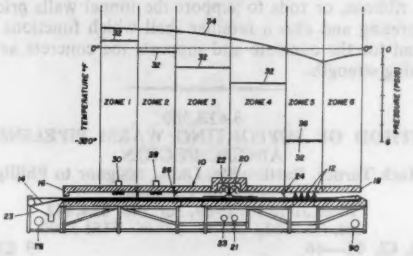


An apparatus suitable for developing cryogenic temperatures. Incoming high-pressure fluid is expanded and further cooled after being initially cooled by heat exchange with returning low-pressure fluid. At least a portion of the work developed in the expander is extracted by compressing a fluid which is circulated back and forth between the expansion chamber and a balancing chamber in which the compression takes place. Means are provided to remove the heat of compression through heat exchange.

3,613,386
CRYOGENIC FREEZER CONTROL

David J. Klee, Emmaus, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Mar. 23, 1970, Ser. No. 21,625
Int. Cl. F25d 13/06
U.S. Cl. 62—64 8 Claims

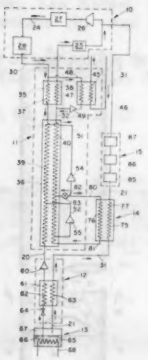


A method and apparatus for controlling the heat transfer characteristics of a spray-type tunnel freezer by combining a signal generated by the temperature measured in the coldest gas recirculation zone of the tunnel with a signal generated by measuring the pressure of the cryogen at the spray header and comparing the combined signal with a known reference signal, a difference between the two signals causing a change in the flow rate of the cryogen. The invention is further characterized in that wide oscillations of recirculating gas temperature and cryogen flow are avoided.

3,613,387
METHOD AND APPARATUS FOR CONTINUOUSLY SUPPLYING REFRIGERATION BELOW 4.2° K.

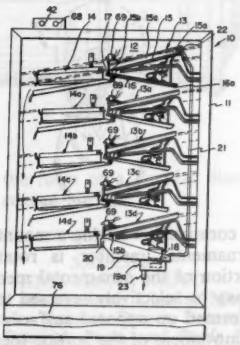
Samuel C. Collins, Belmont, Mass., assignor to Cryogenic Technology, Inc., Waltham, Mass.

Filed June 9, 1969, Ser. No. 831,482
Int. Cl. F25j 3/00
U.S. Cl. 62—100 16 Claims



A cryogenic apparatus capable of continuously supplying liquid helium at a temperature below 4.2° K. by reducing the vapor pressure over liquid helium to the extent required to obtain the desired temperature. The resulting cold, subatmospheric-pressure gas is extracted and, subsequent to its use in indirectly cooling a portion of fluid circulated in an integrated cryogenic refrigerator, is compressed and returned to the system at essentially ambient temperature and pressure.

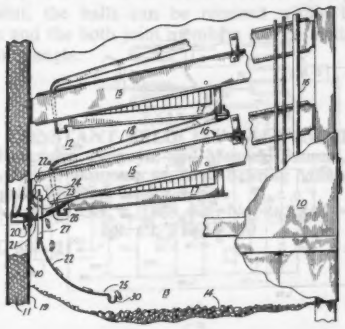
3,613,388
ICEMAKER APPARATUS
Oscar E. Wendt, Benton Harbor, Mich., assignor to Whirlpool Corporation
Filed Oct. 1, 1969, Ser. No. 862,713
Int. Cl. F25c 1/12
U.S. Cl. 62—130 10 Claims



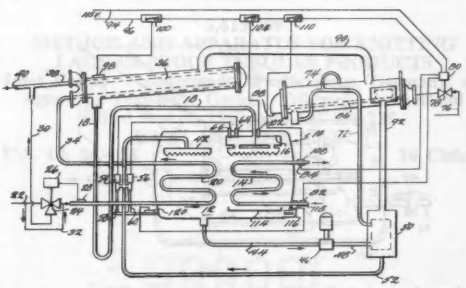
An apparatus for forming ice in the form of slabs which may be subsequently divided into rectangular ice bodies of the desired dimensions. The apparatus includes a plurality of refrigerated plates for concurrently forming a plurality of such slabs. Means are provided for flowing water seriatim over the respective plates and recirculating the water by suitable pump means. Means are provided for freeing the ice slabs from the plates by heating the plates upon completion of the formation of the ice slabs. The apparatus includes a control having means for sensing the failure of a released ice slab to clear the lower end of the plate and thereby at least partially obstruct the means for conducting water from one plate to the subjacent plate, or reservoir, and cause a continuation of the operation of the releasing means until the slab is fully released. The control further includes means for providing a visual indication of the failure of the slab to be completely freed from the plate and delivered to the cutting means. Further, the means for conducting the water from the lower end of one plate to the subsequent plate is provided with improved means for assuring flow of water in the cascading arrangement notwithstanding a partial blocking of the outlet of the conducting means as by slush ice.

3,613,389
ICEMAKER APPARATUS
Leonard W. Ohlsson, St. Paul, and Robert H. Sitko, Stillwater, Minn., assignors to Whirlpool Corporation
Filed Dec. 5, 1969, Ser. No. 882,631
Int. Cl. F25c 1/00
U.S. Cl. 62—137 10 Claims

Apparatus for producing a supply of ice cubes that comprises an automatic ice cube former, control means for controlling the operation of the ice cube former, an ice cube directing means embodied in an inclined plate located adjacent a wall of the apparatus and sloped away from this wall over which the ice cubes pass to direct the cubes away from the wall and into a storage space with the directing means having a lower end portion located at a height corresponding to a desired maximum height of the supply of ice cubes, yieldable means including spring means mounting the directing means for yielding deflection by the ice cubes passing thereover and means such as an electric switch in the electric circuit to the ice cube former operated by deflection of the yielding means for activating the control means and thereby terminating operation of the ice cube former so that an accumulation of ice cubes in the storage space to the desired maximum height covers this lower end of the directing means and thereby retains the directing means in its lowered deflected position to terminate operation of the ice cube former so long as the accumulation of ice cubes is sufficient to maintain the deflected position. In one embodiment the lower end of the directing means has associated therewith a generally horizontal water flow trough to collect water from the ice cubes and direct it to one side of the storage space.



3,613,390
CONTROL CIRCUITS FOR ABSORPTION REFRIGERATION MACHINE
Fred W. Bawel, Boonville, Ind., assignor to Arkla Industries, Inc., Evansville, Ind.
Filed Mar. 3, 1970, Ser. No. 16,021
Int. Cl. F25b 15/06
U.S. Cl. 62—148 2 Claims

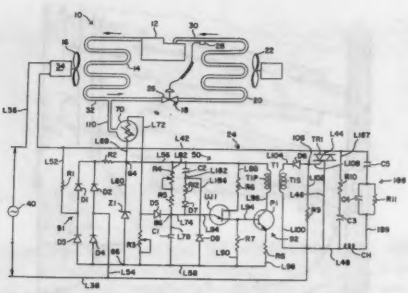


In an absorption refrigerating machine, such as a salt absorption type of machine, control of the temperature in the refrigerant flash chamber is effected by bypassing absorbent around the absorber when the chamber temperature approaches the freezing temperature. Concentration of the salt solution is controlled by withdrawing refrigerant from the circuit into the chamber and dumping the refrigerant into the absorber circuit when there is a drop in the temperature of the cooling water entering the absorber. The heat input to the refrigerant generator is controlled in accordance with the load on the machine as determined by measuring the temperatures of the chilled water entering and leaving the evaporator.

3,613,391
HEAD PRESSURE CONTROL SYSTEM

Donald G. Harter, Scarsdale, N.Y., assignor to White Consolidated Industries, Inc., Cleveland, Ohio

Filed Sept. 12, 1967, Ser. No. 667,275
Int. Cl. F25b *39/04*
U.S. Cl. 62—184 10 Claims

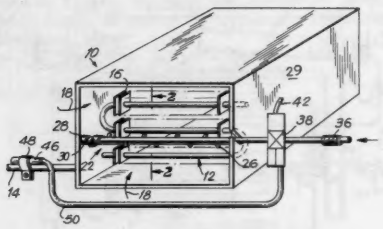


Motor speed controls including ramp and pedestal or phase type speed control circuitry and a pressure sensing transducer for altering the speed of the controlled motor as the sensed pressure changes. An arrangement for controlling the head pressure in a refrigeration type air conditioning system by varying the speed of the system's condensor fan motor which employs such a control and in which the transducer of the control senses the system pressure.

3,613,392
ATTACHMENT FOR AIR-COOLED COOLING UNITS

Charles Di Tucci, 246—12 63rd Ave., Douglaston, N.Y. 11362

Filed Dec. 17, 1969, Ser. No. 885,879
Int. Cl. F25b *39/04*
U.S. Cl. 62—184 10 Claims



An air-cooled cooling unit having condenser coils in the path of a stream of cooling air. A spray tube forms part of an attachment which can be attached to an existing air-cooled cooling unit for spraying water in the space occupied by the condenser coils. A valve is provided for opening and closing the tube. This valve may be a solenoid valve operatively connected with a sensing unit such as a thermostat which senses the outside temperature for opening the valve to admit water to the spray tube when the ambient temperature rises to a given value. In addition a thermal bulb may be operatively connected with the liquid line to open the valve when the liquid in the liquid line rises to a given temperature. In this way additional cooling for the condenser coils is achieved only under overload conditions.

3,613,393
CLAMP TYPE EARRING CONSTRUCTION HAVING REVERSIBLY MOUNTED ORNAMENTAL MEMBER

Roland W. Lamoureux, Warwick, R.I., assignor to Hedison Corp., Providence, R.I.

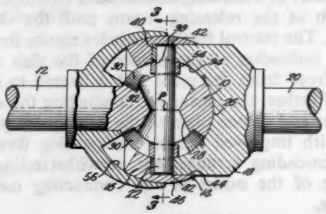
Filed Apr. 7, 1969, Ser. No. 813,967
Int. Cl. A44c *7/00*
U.S. Cl. 63—14 D 4 Claims

An earring construction having a mounting member on which an ornamental member is rotatably mounted, wherein a portion of the ornamental member is also rotatable and may be selectively reversed to expose one of two designs formed on opposed surfaces of the portion, the rotatable movement of the portion locating one of the surfaces in an outer position relative to the wearer's earlobe for visual display.

3,613,394
UNIVERSAL JOINT

Calvin W. Federline, Rte. 1, Box 170, Thurmont, Md. 21701

Continuation-in-part of application Ser. No. 621,978, Mar. 9, 1967, now Patent No. 3,453,841, dated July 8, 1969. This application July 7, 1969, Ser. No. 839,596
The portion of the term of the patent subsequent to Mar. 9, 1984, has been disclaimed
Int. Cl. F16d *3/16*
U.S. Cl. 64—7 7 Claims



This disclosure contains a drawing and a description of a ball and socket type universal joint for transmitting torque between misaligned rotary shafts. Torque transmission between the ball and the socket of the joint is effected by a single transverse pin which is secured to the socket member and which carries bearing means slidably engaged in the ball to facilitate oscillatory movement about a transverse axis therethrough. This disclosure further illustrates and describes the manner in which the joint is assembled.

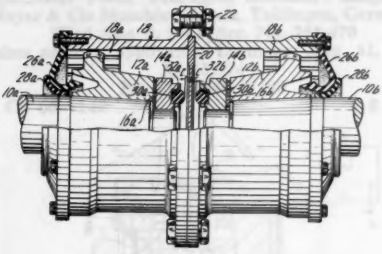
3,613,395
SHAFT COUPLING DEVICE

Junichi Shigeura, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 18, 1970, Ser. No. 38,119
Int. Cl. F16d *3/18*
U.S. Cl. 64—9 R 5 Claims

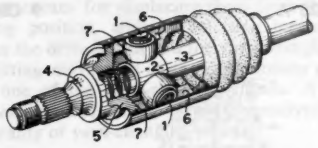
The disclosed coupling device comprises a pair of annular elastic members opposingly disposed on nuts threaded on the end portions of the driving and driven

shafts. A resilient disc is disposed between the elastic members with having clearances therebetween. The hold-



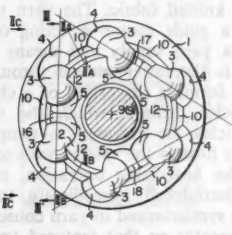
ing plate is in the form of a circular disc decreased in thickness at its central portion.

3,613,396
UNIVERSAL JOINT
Michel Drevard, Montbeliard, Charles Mognetti, Seloncourt, and Andre Vermot, Etupes, France, assignors to Automobiles Peugeot, Paris, and Regie Nationale des Usines Renault, Billancourt, France
Filed Feb. 25, 1970, Ser. No. 14,145
Claims priority, application France, Feb. 26, 1969, 6904894; June 26, 1969, 6921443
Int. Cl. F16d *3/30*
U.S. Cl. 64—21 **11 Claims**



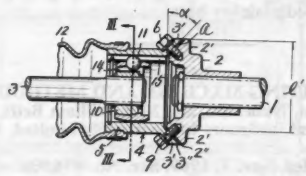
At least one resiliently-yieldable means is interposed between each spherical roller and the first drive element of a universal joint comprising the latter, which carries three trunnions, and a second drive element having three radial pairs of recesses in which the spherical rollers mounted on the trunnions are slidably and rotatably engaged.

3,613,397
CONSTANT-VELOCITY UNIVERSAL JOINT
Hideo Okoshi, Fujisawa-shi, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 3, 1970, Ser. No. 8,314
Claims priority, application Japan, Feb. 7, 1969, 44/8,753; Mar. 22, 1969, 44/21,231
Int. Cl. F16d *3/30*
U.S. Cl. 64—21 **2 Claims**



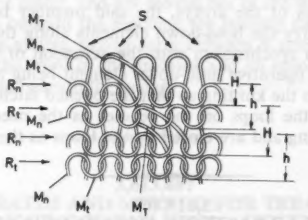
The constant-velocity universal joint consists of an inner and outer joint member. The inner joint member has two conical surfaces on the outer surface thereof, while the outer joint member has two conical surfaces on the inner surface thereof. Each conical surface on the inner joint member is faced to each conical surface on the outer joint member. The facing conical surfaces incline relative to the axial center line of the two members by an angle one-half of the joint angle α, and the intersection line of each pair of facing conical surfaces is on a plane perpendicular to the axial center line (FIG. 1). By this arrangement, the balls can be retained within the guide grooves and the both joint members can be inclined within the joint angle.

3,613,398
CONSTANT VELOCITY BALL JOINT
Hisao Hasegawa, Nagoya, and Masashi Sanami, Takarazuka, Japan, assignors to Toyo Bearing Manufacturing Company Limited, Osaka, Japan
Filed Oct. 6, 1969, Ser. No. 863,845
Int. Cl. F16d *3/30*
U.S. Cl. 64—21 **4 Claims**



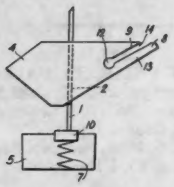
In a universal joint comprising inner and outer members coupled rotationally by torque transmitting balls, the outer member has a conical flange portion, an attaching member for securing the outer member to one of the drive members has a conical flange portion fitting therewith, clamp bolts secure said flange portions together, and the outer member and attaching member further have radial interengaging spline means cooperating to avoid exertion of shearing force in the bolts during driving of the joint.

3,613,399
METHOD AND APPARATUS FOR KNITTING LADDER-PROOF TUBULAR PRODUCTS
Josef Fecker, Freudenstadt, Wurttemberg, Germany, assignor to Texpatent GmbH, Fribourg, Switzerland
Filed Sept. 4, 1969, Ser. No. 855,235
Int. Cl. D04b *9/48, 15/02*
U.S. Cl. 66—55 **10 Claims**



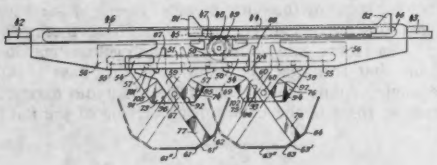
A method and apparatus for knitting ladder-proof tubular products in which the loops are transferred laterally from certain courses to adjacent wales. The loops in the courses from which the loops are transferred are made larger than the loops in the other courses such that, after transfer, all of the courses have loops of approximately the same size.

3,613,400
KNITTING MACHINES
Milan Havranek, Brno, Drahomir Zouhar, Blansko, and Jaroslav Javorek, Trebic, Czechoslovakia, assignors to Elitex, Zavody textilniho strojirenstvi, generalni reditelstvi, Liberec, Czechoslovakia
Filed Sept. 9, 1969, Ser. No. 856,303
Claims priority, application Czechoslovakia, Sept. 13, 1968, 6,427/68
Int. Cl. D04b *15/32*
U.S. Cl. 66—57 7 Claims



Knitting machine cams provided with operatively resilient members to absorb the impact between it and the associated needle/sinker butt.

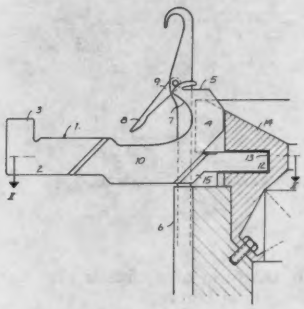
3,613,401
KNITTING MACHINE AND METHOD
Keith Jeffcoat, Nuneaton, and Max William Betts, Coventry, England, assignors to Courtaulds Limited, London, England
Filed Nov. 7, 1969, Ser. No. 874,938
Claims priority, application Great Britain, Nov. 8, 1968, 52,942/68
Int. Cl. D04b *7/00*
U.S. Cl. 66—60 13 Claims



A flat V-bed knitting machine having at least two opposed arrays of latch needles arranged in needle beds and means for actuating needles of the arrays independently in succession along the arrays, is characterised by two hold-down elements carried on the same member which is so mounted that it can be moved to bring the two hold-down elements alternately into an operative position in which the operative element extends beneath active needles of the arrays, the said member being arranged to carry the hold-down elements along the arrays of needles in synchronism with the actuation of the needles and the operative hold-down element being arranged to hold down the knitting so that the opened latches move up through the loops on the needles as the needles rise during knitting and are closed by the loops as the needles descend.

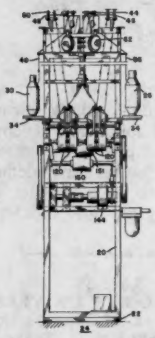
3,613,402
CIRCULAR KNITTING MACHINE SINKERS
Jorge Rectoret Comas, Calle San Agustin 59, Mataro, Barcelona, Spain
Filed Jan. 23, 1969, Ser. No. 803,520
Claims priority, application Spain, Jan. 23, 1969, 350,174
Int. Cl. D04b *15/06*
U.S. Cl. 66—107 2 Claims

Sinkers for a circular knitting machine have a central portion of reduced tangential thickness to facilitate the working of needles between the sinkers. A tongue at the front end of each sinker is received in a continuous



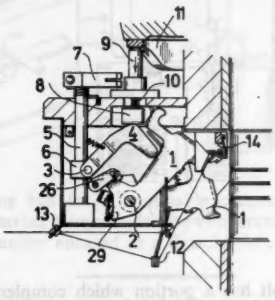
groove in a sinker guide ring. This tongue of each sinker is thicker than the central portion thereof and slidably engages the needles to be guided thereby.

3,613,403
YARN TEXTURING AND KNITTING APPARATUS
Robert Peel, 1502 Reynolda Road, Winston-Salem, N.C. 27104
Filed Aug. 22, 1969, Ser. No. 852,170
Int. Cl. D04b *15/48*
U.S. Cl. 66—125 A 9 Claims



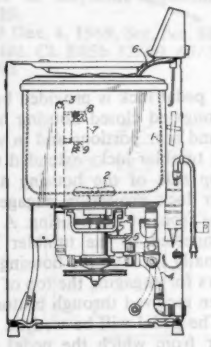
A system for texturing yarn using a flast-twisting technique in which one or more yarn ends are pulled from a yarn supply, twisted, heat-fixed and fed immediately from the heat-fixing means to a knitting machine for the formation of knitted fabric. The yarn texturing apparatus includes a guide means directing one or more yarn ends from a yarn supply and means for twisting the yarn which is thereafter moved through a heater that, in preferred form, is comprised of a chamber filled with small particles through which the twisted yarn moves. The particles are elevated in temperature and uniformly transfer heat to the twisted yarn moving therethrough. After the heat-fixing operation, one or more yarn ends are introduced immediately to a knitting machine which is synchronized in yarn consumption with the texturing apparatus so that textured yarn is fed to the machine continuously as needed during the knitting operation.

3,613,404
YARN-CHANGING DEVICE FOR CIRCULAR KNITTING MACHINES
Ernst-Dieter Plath, Tailfingen, Germany, assignor to Mayer & Cie Maschinenfabrik, Tailfingen, Germany
Filed Aug. 9, 1968, Ser. No. 751,470
Claims priority, application Germany, Aug. 31, 1967, M 75,374
Int. Cl. D04b *15/60*
U.S. Cl. 66—140 8 Claims



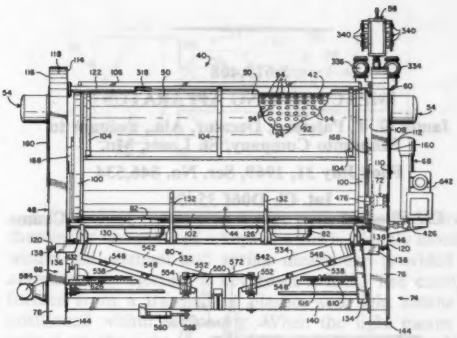
A device for situating a selected one of a plurality of different yarns at a knitting station in a circular knitting machine. The device includes a plurality of yarn-changing means supported by a support means for movement between rest and changing positions with each yarn-changing means situating the yarn controlled thereby at a knitting station when the yarn-changing means is in its changing position. A drive means is common to all of the yarn-changing means for displacing them from the rest to the changing position, while a selecting means is situated between the drive means and the yarn-changing means for transmitting movement of the drive means only to a selected one of the yarn-changing means. A plurality of yarn-clamping-and-cutting means respectively coact with the plurality of yarn-changing means.

3,613,405
WASHING MACHINE
Kazuo Shimokusu and Takashi Korekawa, Osaka, Tomoyuki Hosokawa, Takarazuka-shi, Taro Yamamoto, Kyoto, and Takao Kobayasi, Toyonaka-shi, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Nov. 13, 1969, Ser. No. 876,283
Claims priority, application Japan, Nov. 15, 1968, 43/84,350
Int. Cl. D06f *33/02*
U.S. Cl. 68—12 R 5 Claims



A washing machine which comprises a time switch providing a series of automatic time cycles ranging from washing cycle through rinsing cycle to draining cycle, and in which particularly during the rinsing cycle a photosensitive element detects the transparency of the rinsing water, thereby automatically detecting the completion of the rinsing operation or a point of time at which the concentration of the detergent in the rinsing water is lower than a predetermined level, so that a series of subsequent time cycles takes place.

3,613,406
COMMERCIAL LAUNDRY MACHINE
Alex Toth, Lincolnwood, Ill., assignor to Ellis Corporation, Chicago, Ill.
Filed Mar. 25, 1970, Ser. No. 22,508
Int. Cl. D06f *21/04*
U.S. Cl. 68—140 23 Claims

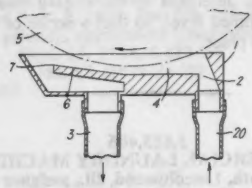


A commercial laundry machine includes an inner perforated cylinder and an outer casing both mounted on a pair of end frames for rotation about their common central axis. Cylinder drive assemblies are coupled to opposite cylinder trunnions for rotating the cylinder during washing operations and each drive assembly includes a shock absorbing gear drive arrangement. A clutch or interlock system serves to fix the casing to the end frames, thereby to hold the casing stationary, or alternatively to fix the casing to the cylinder for simultaneous rotation of the cylinder and casing. Washing fluid, steam, electrical and pressurized air connections are selectively made from the end frames to the casing by means of releasable connection structures. Movably mounted drain chutes serve to transfer discharged washing fluids from the casing to a rear floor gutter, and are moved out of the way to clear the region beneath the machine for laundry carts. A cart positioning system moves carts between a convenient location at the front of the machine and an unloading position directly beneath the casing.

3,613,407
APPARATUS AND METHOD FOR TREATING MOVING YARNS WITH A LIQUID
Geoffrey P. Graham, Grenoble, France, assignor to Societe Rhodiaceta, Paris, France
Filed Mar. 18, 1969, Ser. No. 808,100
Claims priority, application France, Mar. 18, 1968, 144,242
Int. Cl. D06f *35/00*
U.S. Cl. 68—202 5 Claims

The specification discloses an apparatus and method of treating textile yarns with a liquid, in which the yarn is

passed around a portion of the periphery of the disc. The lower periphery of the disc dips into a trough, the width of which is only slightly greater than the axial length, and



the liquid flows through the trough in the same direction as the lower periphery of the disc. A very uniform coating of the periphery is thus achieved.

3,613,408

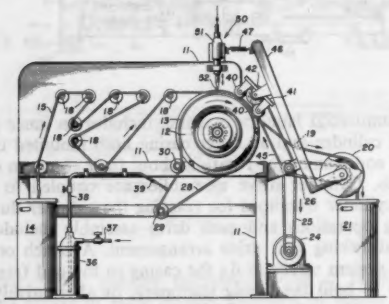
IMPACT DYEING APPARATUS

James G. T. Paterson, Decatur, Ala., assignor to Monsanto Company, St. Louis, Mo.

Filed July 31, 1969, Ser. No. 846,534

Int. Cl. D06f *35/00*

U.S. Cl. 68—204 **5 Claims**



In this invention a tow is passed under tension around a portion of the periphery of a resilient roll. A porous belt extends around the resilient roll in a position between the roll and the tow, the belt carrying a supply of a suitable dye. At a point where the belt is sandwiched between the roll and the tow a suitable mechanism applies impact forces to the tow at a high rate of speed to drive the dye from the belt through the tow.

3,613,409

PADLOCKS

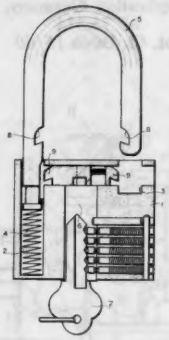
Jose Paioletti, Av. Alcantara Machado, 884–886 Sao Paulo, Brazil

Filed Jan. 5, 1970, Ser. No. 561

Int. Cl. E05b *67/22*

U.S. Cl. 70—38 A **1 Claim**

A lock having a casing provided with two parallel recesses for receiving the legs of a U-shaped shackle, and a locking block which controls the positioning of a locking bolt. Each of the shackle legs is provided with a slot having at least one surface which is oblique with respect to the longitudinal axis of the parallel recesses. The position-



able locking bolt has a portion which complements the slot in the shackle legs to selectively and securely lock the shackle against undesired movement with a double locking effect.

3,613,410

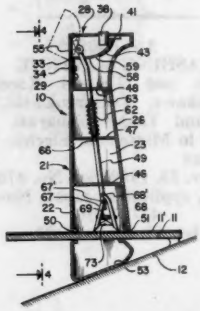
VEHICLE ACCELERATOR PEDAL LOCK

Leonard Shaw, 358 Montgomery St., Brooklyn, N.Y. 11225

Filed June 24, 1970, Ser. No. 49,257

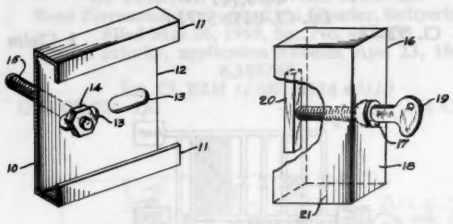
Int. Cl. B60r *25/00*; E05b *73/00*

U.S. Cl. 70—202 **7 Claims**



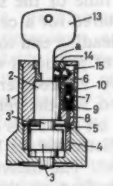
An accelerator pedal lock is provided by this invention comprising an elongated closed housing having top, bottom, side, front and rear portions and in which there is a lock lever having tumbler locks extended thereacross and hinged to the top side of the housing and held closed when the tumbler lock projection engages with the stationary part of the front of the housing. A latch operating rod pivotally connected to the tumbler lock lever and extends longitudinally through the housing and has sharpened grip members for engaging the top of the pedal when the pedal has been received through bottom and top slots of the housing. The pedal will be wedged upwardly from the inclined floor from which the pedal extends and in locked position. A biasing spring is anchored on the rod and connected to the housing to bias the gripping members in engagement with the top of the lever.

3,613,411
LOCKING DEVICE FOR A REMOVABLE CONNECTOR
Gerald L. Crump, 6250 NW. 18 Court, Sunrise Golf Village, Fla. 33313
Filed June 26, 1969, Ser. No. 836,731
Int. Cl. F16b *41/00*
U.S. Cl. 70—232 3 Claims



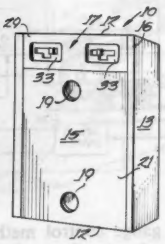
A locking box for a removable connector with a flat housing having flanged sides for cooperation with a locking mechanism encased in a detachable cover.

3,613,412
STEERING COLUMN LOCK
Kenichi Yamaguchi, Chigasaki, Japan, assignor to Nagatoshi Suzuki, Tokyo, Japan
Filed Aug. 17, 1970, Ser. No. 64,327
Int. Cl. B60r *25/02*; E05b *63/18*
U.S. Cl. 70—252 1 Claim



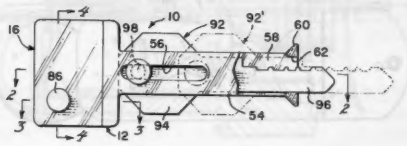
The invention relates to a steering column lock having a lock cylinder and provided with a safeguard against accidental locking of the steering through retaining the bolt in releasing position until the key is completely withdrawn from the lock. Said safeguard comprises a key controlled retaining pin and the corresponding catch slot formed in one side of a bolt portion.

3,613,413
COMBINATION LATCH AND LOCKING MECHANISM
Dwight W. Glass and Robert L. Dauenbaugh, Rockford, Ill., assignors to Keystone Consolidated Industries, Inc., Peoria, Ill.
Filed Dec. 4, 1969, Ser. No. 882,027
Int. Cl. E05b *32/00, 65/52*
U.S. Cl. 70—298 9 Claims



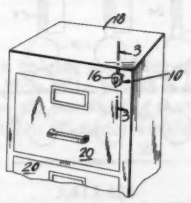
A combination latch and locking mechanism for small containers having a slidable door or cover forming one side of the container, including two or more slidable latching buttons, each button having several predetermined positions and provided with a locking finger depending beyond the mechanism to engage a rib formed on the underside of the slidable cover. The rib has a gate positioned for each button to allow passage of the finger and movement of the cover when the buttons have been shifted to their unlocked positions.

3,613,414
SELF-EJECTING KEYHOLDER WITH ILLUMINATION
Seymour A. Ostrager, 1188 Grand Concourse, Bronx, N.Y. 10456
Filed Dec. 22, 1969, Ser. No. 886,809
Int. Cl. E05b *19/00*
U.S. Cl. 70—414 5 Claims



A keyholder comprising a case with a channel formed therein for reception of a key. The key is slidably mounted within the channel and spring means are provided for automatically ejecting a key from a lock. The casing is formed from a transparent plastic, and light means are positioned within the casing. When the light means are turned on, the light produced will be diffused through the transparent plastic, thereby illuminating the key and the associated lock, and thus facilitating the insertion of the key in the lock.

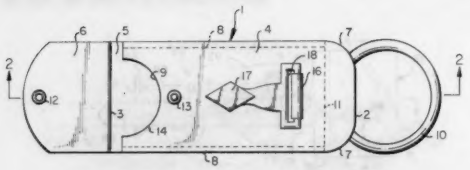
3,613,415
HOLDING DEVICE FOR LOCK CYLINDERS
M. Leonard Singer, 1500 Cardinal Drive, Little Falls, N.J. 07424, and Robert M. Woletz, 789 Main St., Hackensack, N.J. 07601
Filed Mar. 17, 1970, Ser. No. 20,292
Int. Cl. E05b *15/00*
U.S. Cl. 70—447 10 Claims



A device for preventing the accidental or malicious locking of a plunger type lock cylinder of a device such as filing cabinet includes a member which is adapted to be engaged around at least a portion of the lock cylinder when the lock cylinder is in an extended open position and hold it in this position against the possibility of it being closed. The device includes a sleeve member which may be made of a rigid material such as metal or of a resilient or semi-resilient material such as plastic or rubber and it includes means for anchoring it in position

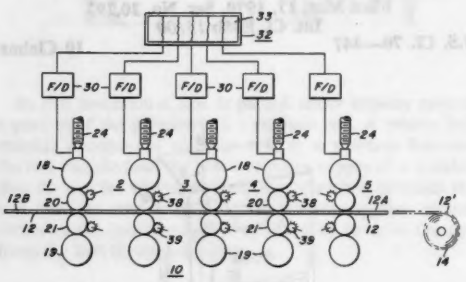
around at least a portion of the lock cylinder so as to engage the cylinder and prevent it from being moved backwardly into the accommodating recess therefor on a filing cabinet. The device includes means for clamping it in position which in one form of the invention comprises a rotatable screw which may be moved by either a screw driver or a unique tool to permit its fastening or release from the associated lock cylinder.

3,613,416
KEY FOB
Douglas W. Paton, 1534 Albemarle Way, Burlingame, Calif. 94010
Filed Nov. 12, 1969, Ser. No. 875,965
Int. Cl. A44b *15/00*
U.S. Cl. 70—456 R **7 Claims**



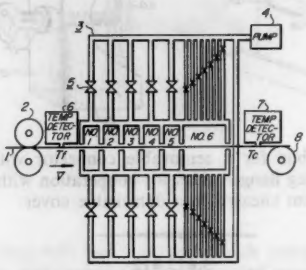
A key fob is disclosed comprising a pouch with a closure flap therefor, a key ring attached to the bottom of the pouch, and a medallion or other insignia attached to the exterior of the pouch by means of interlocking loops of material.

3,613,417
PROCEDURE FOR CONTROLLING A MULTISTAND ROLLING MILL
Wilton A. Woodburn, Lower Burrell, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.
Filed Feb. 9, 1970, Ser. No. 9,867
Int. Cl. B21b *37/00*
U.S. Cl. 72—8 **3 Claims**



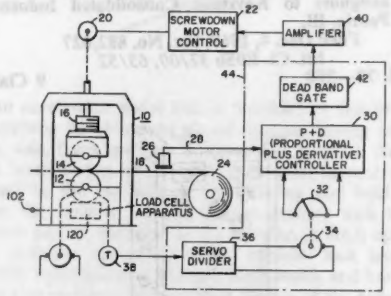
A method of controlling the tracking of a traveling strip of material being reduced in thickness by the working rolls of a multistand mill. The method includes the steps of measuring the rolling force adjacent the ends of the working rolls to provide force-differential information for each stand of the mill. This information is monitored with reference to a time base, and when force-differentials occur indicating an error in stand level or frictional forces, correction of stand level and/or frictional forces are effected in a predetermined procedure on the basis of the time based, force-differential information.

3,613,418
AUTOMATIC CONTROL SYSTEM FOR HOT STRIP MILL AND THE LIKE
Akinao Nara, Kodaira-shi, and Masahisa Ono, Nishinomiya-shi, Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, and Hitachi, Ltd., Tokyo, Japan
Filed Jan. 26, 1970, Ser. No. 5,493
Claims priority, application Japan, Feb. 12, 1969, 44/9,717
Int. Cl. B21b *37/10*
U.S. Cl. 72—8 **1 Claim**



Spray valves are sequentially manipulated in the order of from the input side to the output side of a hot strip mill and the succeeding one has a larger cooling power than that of the preceding one. A computing device for computing the on-off time of the spray valves computes the cooling power required for a certain length of a sheet bar ranging from the leading end to a certain point of the sheet bar on the basis of predicted values of various process variables given by a predetermined program. The cooling power required for the remaining length of the sheet bar is computed on the basis of the values obtained by correcting the predicted values by the detected values of the process variables. The individual spray valves are turned on or off depending on the cooling power computed in this manner.

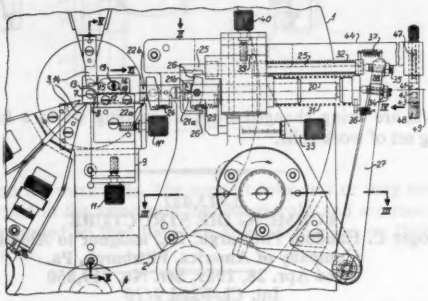
3,613,419
ROLLING MILL AUTOMATIC GAUGE CONTROL WITH COMPENSATION FOR TRANSPORT TIME
Antonio V. Silva, Buffalo, N.Y., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Aug. 1, 1969, Ser. No. 846,803
Int. Cl. B21b *37/12*
U.S. Cl. 72—8 **9 Claims**



Described are a gauge control method and apparatus for a rolling mill wherein the transport time required for the material being rolled to pass from the bite of the rolling mill rolls to a gauge measuring device is

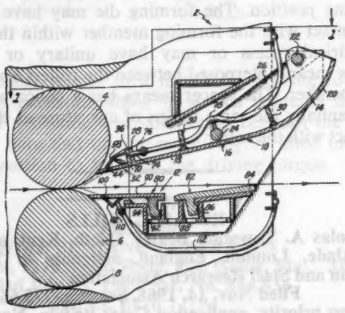
compenstated for by means of circuitry having a transfer function which is the inverse of the transfer function of the transport time.

3,613,420
AUTOMATIC MACHINE FOR THE MANUFACTURE OF PLANAR STEEL WIRE SPRINGS
Rene Perrenoud, 14 Sugits, 2114 Fleurier, Switzerland
Filed May 26, 1969, Ser. No. 827,535
Claims priority, application Sweden, Apr. 23, 1969, 6,109/69
Int. Cl. B21f *11/00*; B21d *43/10*
U.S. Cl. 72—131 4 Claims



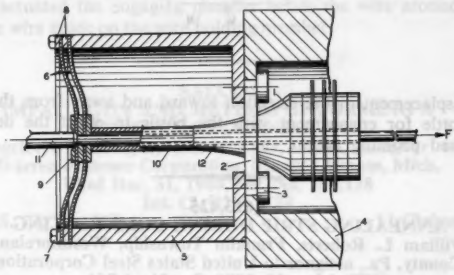
A machine for the manufacture of planar steel wire springs, notably for timepieces, comprises a plate member on which are slidably mounted forming tools sliding in the direction of the center of the plate, means for advancing the wire, and means for clamping and cutting the wire. The means for advancing the wire extend parallel to the plate member to ensure an advance of the wire parallel to the plate member and the advancing means comprises a clamping device for the wire and a braking device for the wire co-operating with the clamping device to maintain the wire under tension.

3,613,421
METHOD AND APPARATUS FOR ELIMINATING IRON OXIDE DUST
Theodore A. Repper, 501 Stanley St., Middletown, Ohio 45042
Filed June 17, 1969, Ser. No. 834,030
Int. Cl. B21b *9/00, 45/04*
U.S. Cl. 72—38 8 Claims



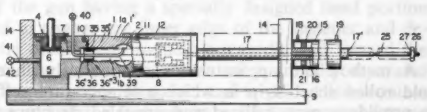
Iron oxide dust formation at the work rolls in a hot rolling mill for sheet steel is eliminated by establishing an inert atmosphere at the exit side of the rolls, specially constructed upper and lower strippers having nozzles mounted therein being arranged to spray an inert gas into the bite region of the work rolls to establish the inert atmosphere.

3,613,422
WIRE DRAWING APPARATUS AND METHOD USING INTERMEDIARY IMPACT DEVICE
Lytton A. Kendall, Jr., Columbus, Ohio, assignor to The Ohio State University, Columbus, Ohio
Filed Apr. 28, 1969, Ser. No. 819,750
Int. Cl. B21c *3/00*
U.S. Cl. 72—56 10 Claims



This invention is an apparatus for drawing wire utilizing an axially apertured piezoelectric electromechanical transducer and axially apertured straight vibratory-mechanical transmission line in conjunction with a wire-drawing die (impacted by the transmission line) to reduce the cross section of the wire. Reference is made to the claims for a legal description of the invention.

3,613,423
BULGING APPARATUS
Masanobu Nakamura, 2–10–2 Shichirigahama Higashi, Kamakura, Kanagawa, Japan
Filed Jan. 2, 1970, Ser. No. 228
Int. Cl. B21d *26/04*
U.S. Cl. 72—58 1 Claim

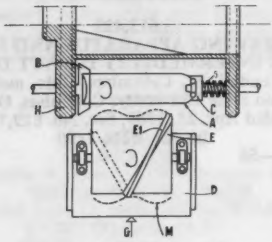


A fluid pressure bulging apparatus comprised of a die cavity in which a tube to be bulged is enclosed. A chuck automatically grips the front end of the tube to permit accurate bulging without off-center working.

3,613,424
METHOD AND APPARATUS FOR SHAPING BOTTLES
Norbert Normos, Courbevoie, France, assignor to Societe de Conditionnement en Aluminium (SCAL) GP, Paris, France
Filed Jan. 2, 1969, Ser. No. 788,559
Claims priority, application France, Jan. 9, 1968, 135,260
Int. Cl. B21d *22/14*
U.S. Cl. 72—103 5 Claims

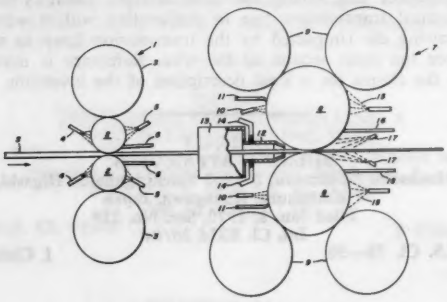
Method and apparatus for profiling bottles to any form of revolution in the absence of internal formers comprising a means for mounting the bottle for rotational

movement about its axis and a tool having an edge in the form of an open spiral applied against a mandrel and which is mounted for rotational movement and for



displacement in the direction toward and away from the bottle for engagement with the bottle to effect the desired profiling action.

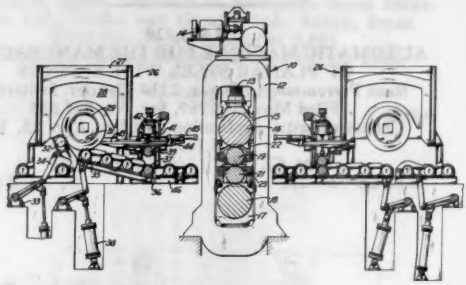
3,613,425
ANNEALING STRIP DURING COLD ROLLING
William L. Roberts, Franklin Township, Westmoreland County, Pa., assignor to United States Steel Corporation
Filed Jan. 29, 1970, Ser. No. 6,861
Int. Cl. B21b *37/00, 37/04, 1/00;* **B21d** *31/00*
U.S. Cl. 72—202 **14 Claims**



A method and apparatus for continuously annealing cold rolled sheet strip in which a temperature sufficient to provide a recrystallized and annealed structure is attained by utilizing the energy of deformation to provide the required ultra-fast heat-up rate.

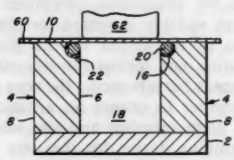
3,613,426
HOT REVERSING STRIP MILL METHOD AND APPARATUS
James Richard Adair and Tadeusz M. Bijasiewicz, Pittsburgh, Pa., assignors to United Engineering and Foundry Company, Pittsburgh, Pa.
Filed Oct. 14, 1969, Ser. No. 866,214
Claims priority, application Great Britain, Nov. 4, 1968, 52,101/68
Int. Cl. B21b *27/06, 1/22*
U.S. Cl. 72—202 **10 Claims**

The disclosure of this application relates to a rolling mill and, more particularly, to a hot metallic strip reversing mill of the type known as a Steckel Mill. There is provided a 4-high mill on either side of which there are located coiling furnaces and reels for receiving the strip as it is passed to and from the mill. The mill is also provided with a quick roll changing device in which connection the novel method is disclosed for employing the furnace to hold the strip in the furnace while the work



rolls are being changed from a roughing set to a finishing set of work rolls.

3,613,427
FORMING DIE STRUCTURE
Roger C. Haddon, Pittsburgh, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.
Filed Apr. 28, 1969, Ser. No. 819,850
Int. Cl. B21d *9/10*
U.S. Cl. 72—212 **5 Claims**

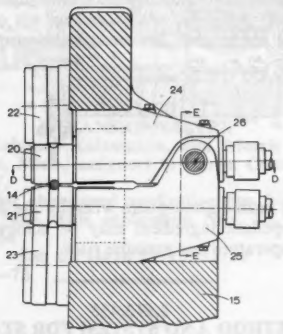


A forming die having a base member and an elongated forming member secured to the base member, the forming member having an inner surface, an outer surface and a connecting sheet contacting surface. The forming member defines an elongated recess disposed generally at the intersection of the inner surface and the sheet contacting surface. A cylindrical roller which is rotatably supported is disposed within the recess. In one form the die is particularly suited to bending decorated sheet without creating surface damage. It has two spaced parallel forming members secured to the base member in channel defining position. The forming die may have the rollers in contact with the forming member within the generally cylindrical recess or may have unitary or segmented spacer means interposed between the rollers and the forming member. The spacer means has a concave surface of substantially the same radius of curvature as the roller, in contact with the roller.

3,613,428
ROLLING MILLS
Nicholas A. Towsend, Bexley Heath, Kent, and Roy R. Oxlade, London, England, assignors to The British Iron and Steel Research Association
Filed Nov. 14, 1968, Ser. No. 775,668
Claims priority, application Great Britain, Nov. 15, 1967, 52,090/67
Int. Cl. B21b *31/00*
U.S. Cl. 72—237 **20 Claims**

A four high rod or bar rolling mill, wherein the work rolls and their drive shafts are carried for rotation in arms

mounted in the mill frame for pivotal movement about defined pivot axes (or a common pivot axis) extending parallel to and spaced a fixed distance from the stock pass line, whereby to permit adjustment of the work gap



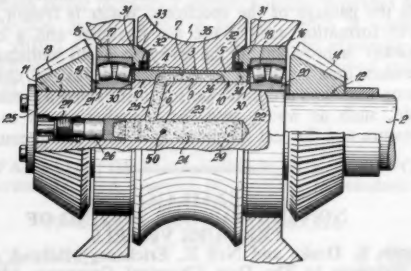
between the work rolls. The support rolls may or may not be carried in the arms with their work rolls and are movably mounted so that they can align themselves on their work rolls.

3,613,429

MEANS FOR SECURING OF ROLLING MILL ROLLS IN PARTICULAR THOSE IN STRETCH REDUCING MILLS

Karl-Heinz Schwarzenberg, Rumeln-Kaldenhausen, and Rolf Michel, Bochum-Hovel, Germany, assignors to Demag Aktiengesellschaft, Duisburg, Germany

Filed July 30, 1969, Ser. No. 846,078
Claims priority, application Germany, Aug. 1, 1968, P 17 52 902.1
Int. Cl. B21b *35/00*
U.S. Cl. 72—249 **8 Claims**



The disclosure relates to a means of securing rolling mill rolls, in particular those in stretch reducing mills, consisting of a friction-type connection between the roll body centre bore and one or more ring(s) fitted to the drive shaft portion to transmit the driving torque.

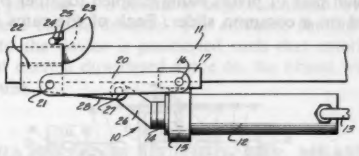
3,613,430

WIRE BENDING APPARATUS

Silas R. Crees, 1170 Sarno Road, Eau Gallie, Fla. 32935

Filed July 25, 1969, Ser. No. 844,836
Int. Cl. B21d *11/04*
U.S. Cl. 72—318 **14 Claims**

A wire bending apparatus for bending electrical cables, or the like, in narrow confines such as panel boxes. The apparatus is connected to an electrical conductor by a wire holding member which is connected to a hydraulic cylinder by two separate linkages, one connected to the hydraulic cylinder and one connected to the rod of the cylinder. The hydraulic cylinder also has a wire engaging



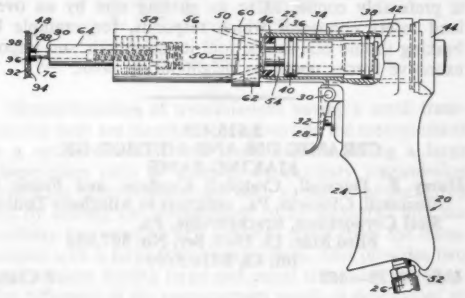
member attached thereto and when the hydraulic cylinder is actuated the engaging member bends the wire around the wire guide on the wire holding member.

3,613,431

IMPACT GUN AND METHOD OF FORMING A STRUCTURAL CONNECTION

Engelbert A. Meyer, Union Lake, Mich., assignor to Warren Fastener Corporation, Mount Clemens, Mich.

Filed Dec. 31, 1968, Ser. No. 788,138
Int. Cl. B21j *7/24*
U.S. Cl. 72—369 **11 Claims**



An impact gun adapted to deform the tubular end of a fastener secured to a support, including a plunger means supported for reciprocating movement by the body portion of the gun having a specially designed head portion adapted to engage the inner edge of the fastener and deform the tubular end radially outwardly and toward the support. The head portion or anvil is initially separated from the plunger or hammer, and is guided into contact with the end of the fastener by a pilot supported for reciprocation within the head portion. The method disclosed herein includes disposing a supporting member within the tubular fastener and impacting the fastener end.

3,613,432

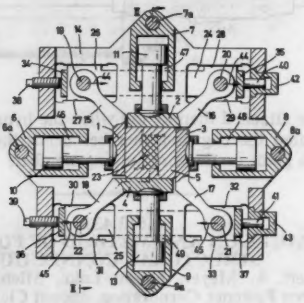
FORGING MACHINE

Horst Schenk, Dusseldorf-Rath, Jakob Wetter, Huls, and Rudolf Guse, Dusseldorf-Rath, Germany, assignors to Maschinenfabrik Sack G.m.b.H., Dusseldorf-Rath, Germany

Filed Dec. 2, 1969, Ser. No. 881,467
Claims priority, application Germany, Dec. 2, 1968, P 18 12 169.2
Int. Cl. B21j *9/12*
U.S. Cl. 72—399 **17 Claims**

A forging machine is disclosed having four forging saddles carried on guiding arms which are pivoted on a frame. Each saddle has a hydraulic ram by which it can be moved inwards in use, the four saddles embracing a workpiece and reducing its cross-section. The pivots of the guiding arms are shiftable relatively to the

frame whereby the machine is capable of forging rectangular section bar, the ratio between the sides of the rectangle taking any value within a range. For ease of adjustment the four pivots are arranged as two adjacent pairs, each pair of pivots being coupled together by being mounted on a common slider. Each of the rams is pref-

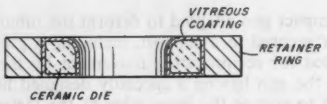


erably rigidly fixed to the frame and connected to its saddle through a doubly articulated joint. Each saddle is preferably connected to its guiding arm by an overload safety connector which responds, for example by braking should one saddle foul its neighbour and impose excessive forces upon the neighbouring pivot.

3,613,433
CERAMIC DIE AND METHOD OF MAKING SAME

Harry E. Deverell, Craigdell Gardens, and Frank L. Muscatell, Gibsonia, Pa., assignors to Allegheny Ludlum Steel Corporation, Brackenridge, Pa.

Filed Mar. 13, 1969, Ser. No. 807,096
Int. Cl. B21c *3/00*
U.S. Cl. 72—467 **3 Claims**



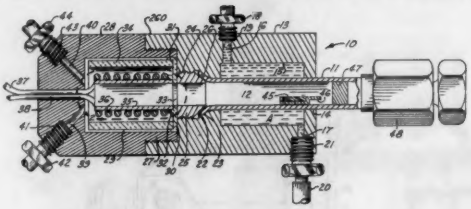
Described herein is a ceramic die for use in shaping metal by extrusion, drawing, etc., which contains a smooth, continuous coating of vitreous material diffusion bonded to the ceramic body. Also disclosed is a method of making such a ceramic die.

3,613,434
DIFFERENTIAL PRESSURE ANALYZER FOR PROPELLANT INGREDIENTS

William W. Schwarz, Huntsville, David A. Flanigan, Guntersville, and William C. Aycock, Huntsville, Ala., assignors to Thiokol Chemical Corporation, Bristol, Pa.

Filed Aug. 21, 1969, Ser. No. 851,869
Int. Cl. G01n *33/22*
U.S. Cl. 73—35 **4 Claims**

An apparatus including a heated chamber and a cooled chamber that are connected together in interaxial relation with each other, and having a coaxial passageway therebetween which is gas pressurized, a pressure indicator and a temperature indicator connected to the heated chamber, a micro-combustion boat positioned for free sliding movement within the passageway, a magnetic plug positioned adjacent to the boat so that when a propellant ingredient is placed in the boat, it may be subjected to a cooling temperature and at a predetermined time the plug may be moved under the influence of a magnet to move the

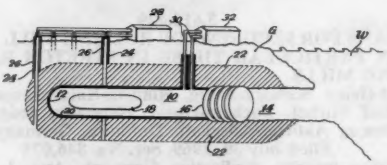


boat into a heated atmosphere whereby the decomposition of the propellant ingredient may be achieved under recorded temperature and pressure rises.

3,613,435
METHOD AND SYSTEM FOR STATIC TESTING STRUCTURES

Philip J. Anderson, Deerfield, Ill., assignor to Institute of Gas Technology

Filed Apr. 16, 1970, Ser. No. 29,011
Int. Cl. G01m *3/02, 10/00*
U.S. Cl. 73—37 **12 Claims**

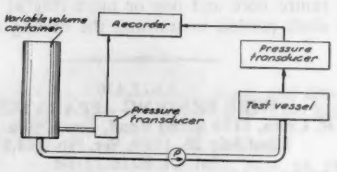


A method and system for pressure testing a large test specimen exteriorly. A test chamber is excavated in an earth formation for receiving the test specimen. An entry is provided in the formation to the test chamber permitting the passage of the specimen. Water is frozen in the earth formation around the test chamber and a closure member is provided in the entry so as to withstand the pressure load imparted to the specimen in the chamber. Pump members are provided for introducing a pressurized fluid, such as water, into the chamber so as to static pressure test the test specimen at desired test pressures.

3,613,436
NON-DESTRUCTIVE TESTING OF PRESSURE VESSELS

Lewis R. Drake and Neil R. Erickson, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed July 28, 1969, Ser. No. 845,349
Int. Cl. G01m *3/02, 19/00*
U.S. Cl. 73—37 **7 Claims**



A liquid volume transducer in a method of hydrostatic testing of pressure vessels. The volume transducer comprises a liquid container having a constant cross-sectional area from top to bottom and provided with means for

varying the volume of liquid in the container while providing a constant cross-sectional area and the same initial height of liquid. A pressure transducer is connected near the bottom of the container to indicate the change in pressure caused by a drop in height of liquid in the container when it is withdrawn through a liquid outlet. Because the liquid has a constant cross-sectional area from its surface to the bottom of the container the change in pressure is proportional to the volume of liquid withdrawn.

3,613,437

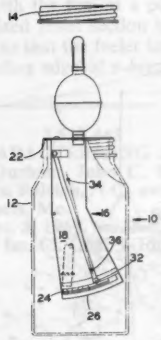
EXPANSION METER

Theodore Colgren, Kalamazoo, and Morris W. Kane, Parchment, Mich., assignors to Brown Company, New York, N.Y.

Substituted for abandoned application Ser. No. 787,728, Dec. 30, 1968. This application Nov. 25, 1969, Ser. No. 879,864

Int. Cl. G01n *19/10, 35/34*

U.S. Cl. 73—73 **3 Claims**



An improved expansion meter is provided for measuring the rate of expansion of a material as a function of the relative humidity of the surrounding environment. The expansion meter includes a sealed container provided with a deflection gauge having a pointer which is adapted to be shifted along the gauge scale by the expansion or contraction of the material under predetermined conditions of relative humidity within the container.

3,613,438

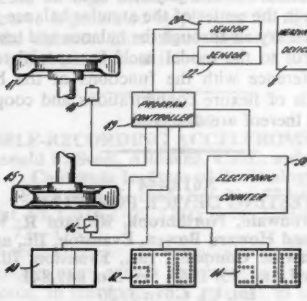
APPARATUS FOR FUEL EFFICIENCY TESTING

Norman D. Esau, Lansing, Ill., assignor to Standard Oil Company, Chicago, Ill.

Filed Oct. 9, 1969, Ser. No. 865,126

Int. Cl. G01l *3/24*

U.S. Cl. 73—113 **8 Claims**



A device for demonstrating the comparative performance of fuel uses in combination a volumetric measuring device, a fuel consuming device (such as an automobile), simple performance measuring devices and visual display indicators. The volumetric measuring device includes an outer reservoir and an inner tube for retaining fuel, and appropriate sensing means, such as photocells, whereby the position of a floatable object confined within the inner tube can be detected. The entrance for introducing fuel into the device is positioned such that entering fuel will not exert a downward force on the object within the inner tube.

3,613,439

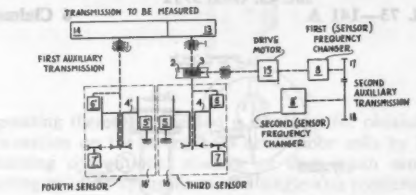
APPARATUS AND METHOD FOR MEASURING NONUNIFORMITIES OF TRANSMISSIONS HAVING A SMALL TRANSMISSION RATIO

Karel Štěpánek, Prague, Czechoslovakia, assignor to Vyzkumny ustav obrabecich stroju a obrabeni, Prague, Czechoslovakia

Filed Apr. 21, 1969, Ser. No. 817,645

Int. Cl. G01m *13/02*

U.S. Cl. 73—118 **4 Claims**



Nonuniformities of transmissions having a small transmission ratio are measured by converting the measurement to a measurement of two transmissions having a large transmission ratio by utilizing an auxiliary transmission having the same transmission ratio as that to be measured and by driving the transmission to be measured and the auxiliary transmission at a different speed from the transmission with a large transmission ratio. This provides two transmissions having large and equal transmission ratios. The difference in the measurement results is determined to eliminate the nonuniformities of the auxiliary transmissions and such difference indicates the nonuniformities of the transmission to be measured.

3,613,440

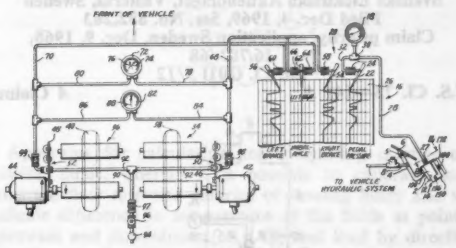
BRAKE PEDAL PRESSURE SIGNAL SENDING UNIT

Leland P. Tinkham, Temple City, Calif., assignor to Clayton Manufacturing Company, El Monte, Calif.

Filed Mar. 27, 1969, Ser. No. 811,167

Int. Cl. G01l *5/28*

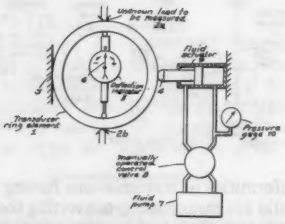
U.S. Cl. 73—132 **14 Claims**



A hydraulic pressure signal sending unit for use with an assembly for measuring the force applied to an automobile brake pedal by the foot of an operator, the sending unit being detachably mountable upon a conventional

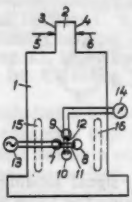
brake pedal and being connected with a remote fluid pressure gauge. The sending unit is operated manually and is designed to translate foot pressure into hydraulic pressure, which is transmitted through a flexible hose to the pressure gauge. The sending unit includes a rolling diaphragm mounted in a housing, and to which diaphragm foot pressure is applied through a pivoted pressure plate mounted on said housing and a treadle pivotally mounted on said pressure plate. The pivotal axis of the pressure plate is adjacent one end thereof and parallel with the pivotal axis of the treadle, which is about midway of the length of the pressure plate. This arrangement, coupled with the rolling diaphragm makes the sending unit insensitive to the angle at which foot pressure is applied.

3,613,441
ZERO DEFLECTION LOAD TRANSDUCER
Ralph R. Papirno, Norfolk, Mass., assignor to the United States of America as represented by the Secretary of the Army
Filed Jan. 19, 1970, Ser. No. 3,662
Int. Cl. G01l *5/12*
U.S. Cl. 73—141 A **6 Claims**



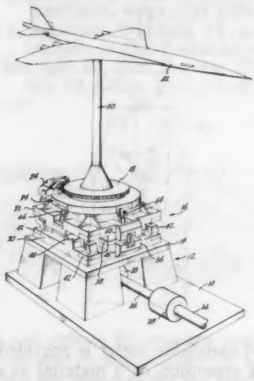
A load to be measured tends to deflect, crush or warp a ring type of transducer. However, a sensor detects the slightest deflection or warping of the ring and actuates apparatus to restore the ring so that the net result is substantially zero deflection of the transducer ring. The force required of the apparatus, to hold the transducer ring or to restore the ring to zero deflection, is proportional to the force applied to the ring. By measuring this force, by a hydraulic pressure gage, for example, the magnitude of the load to be measured can be ascertained. In simple terms, a "heavy duty" yet very sensitive scale is provided to indicate light or heavy weight or force. Nevertheless, the sensing element incurs substantially zero deflection. And, this is true even when comparatively lightweight and inexpensive apparatus is used.

3,613,442
MAGNETO-ELASTIC TRANSDUCER FOR LATERAL FORCE
Nils Ove Bielsten, Vasteras, Sweden, assignor to Allmänna Svenska Elektriska Aktiebolaget, Vasteras, Sweden
Filed Dec. 4, 1969, Ser. No. 882,263
Claim priority, application Sweden, Dec. 9, 1968, 16,783/68
Int. Cl. G01l *5/12*
U.S. Cl. 73—141 A **4 Claims**



A magneto-elastic force transducer formed by a laminated core of magneto-strictive material has apertures containing a flux generating winding and a measuring winding. The core is a beam fixed at one end, the other end having engagement surfaces for forces which are exerted generally perpendicular to the longitudinal direction of the beam. The apertures extend perpendicular to the longitudinal direction of the beam and of the force operating on it. The parts of the core between the aperatures have a longitudinal direction which substantially coincides with the direction of the main stresses in the shearing stress field. The beam may be provided with slots or the openings may be of enlarged generally triangular cross section in order to reduce the stiffness of the beam.

3,613,443
LARGE SCALE EXTERNAL BALANCE FOR WIND TUNNELS
Truman M. Curry, Mercer Island, Wash., assignor to The Boeing Company, Seattle, Wash.
Filed Dec. 22, 1969, Ser. No. 886,914
Int. Cl. G01m *9/00*
U.S. Cl. 73—147 **27 Claims**

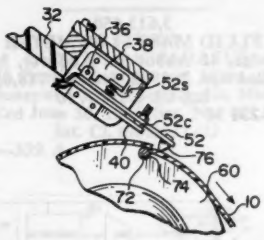


A large scale external balance for wind tunnel applications which can measure the six basic components of force and moment acting on a test model from a location outside the wind tunnel is adapted to cover a broad range of test requirements with compact, lightweight rigid design. The disclosed balance consists of three annular plate structures assembled in spaced relationship separated and supported by flexure members having the same temperature coefficient of expansion as the plate structures and permitting simultaneous measurement of strains proportional to the six components of loading. The strains are localized to minimize deflections and are measured as reactions internal to the structure by strain gauges wire in bridge circuits to measure the forces and moments about a reference center external to the physical body of the balance itself. A space in the center of the annular balance permits ducting of auxiliary air through the balance and test model supporting strut to the model itself for special test uses without interference with the functions of the balance. Various details of flexure configurations and cooperative arrangements thereof are disclosed.

3,613,444
TESTING DEVICE FOR FILM
Robert F. Grunwald, Northbrook, Richard R. Wallace, Wilmette, and Howard Bowen, Evanston, Ill., assignors to The Harwald Company, Inc., Evanston, Ill.
Filed Aug. 13, 1969, Ser. No. 849,841
Int. Cl. G01n *3/20*
U.S. Cl. 73—157 **5 Claims**

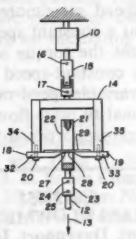
The film to be tested is moved along a predetermined path at high speed and is supported by the flanges of a

roller which engage the film at points spaced from the edges of the film, preferably in the areas of the edges of the picture track of the film. A fixed jewel section engages one face of the film and supports the edge thereof in the vicinity of a test feeler which engages the film on the face



opposite said one face. The test feeler is resiliently urged into engagement with the film at a point spaced longitudinally from the fixed jewel section but the longitudinal separation is small so that the feeler has substantial movement when the leading edge of a break in the film is encountered.

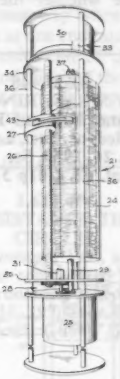
3,613,445
FABRIC CHARACTERIZING APPARATUS
Robin W. Dent, Durham, John C. Oatfield, Cary, and Richard T. Mayes, Raleigh, N.C., assignors to Monsanto Company, St. Louis, Mo.
Filed Dec. 3, 1969, Ser. No. 881,790
Int. Cl. G01l *5/10*
U.S. Cl. 73—159 **3 Claims**



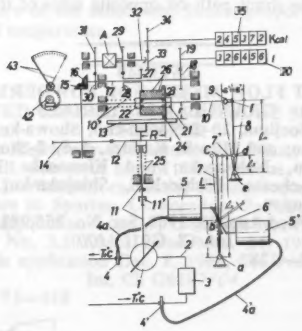
An apparatus and method for determining the roughness and stiffness components of the hand of a fabric from a load-extension curve are provided. The test fabric is forced vertically downward through a slot at a constant speed for a distance which is at least greater than one-half the width of the slot. A signal is generated in proportional response to the load incurred in moving the fabric into and through the slot while simultaneously measuring the distance through which the fabric moves. A load-extension curve is generated by plotting the signal as a function of the distance. Smoothness and stiffness (as well as "hand") are obtained from this curve.

3,613,446
SELF-RECORDING ACCELEROMETER
Ronald F. Scott, Altadena, Calif., assignor to California Institute of Technology
Filed Nov. 5, 1968, Ser. No. 773,489
Int. Cl. G01n *1/00*; G01v *9/00*; G01d *9/10*
U.S. Cl. 73—170 **27 Claims**

A self-recording, single-axis accelerometer is provided by utilizing a mass, which moves against a bellows-type spring force, in the form of a cylinder to carry a chart. A lead screw parallel to the cylinder axis, and geared thereto, advances a stylus assembly from one end of the drum to the other as the cylinder is rotated at constant speed. When subjected to acceleration, the cylinder is displaced along its axis, thereby causing the trace of the stylus to depart from its helical path in proportion to the magnitude of the acceleration, and in a direction corresponding thereto. A method is disclosed for obtaining information on the strength of ocean-floor soils by instrumenting conventional shallow or deep-ocean sampling, coring or other apparatus with a single-axis accelerometer.



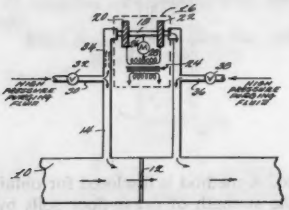
3,613,447
CALORIMETER FOR FLOWING FLUIDS
Shigeji Ishikawa, Yuji Terayama, and Masuhiro Wada, Tokyo, Japan, assignors to Oval Kiki Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed July 24, 1969, Ser. No. 844,422
Claims priority, application Japan, July 31, 1968, 43/65,428; May 27, 1969, 44/48,370
Int. Cl. G01k *17/06*
U.S. Cl. 73—193 R **6 Claims**



Apparatus for calculating and integrating calories of flowing fluids, wherein it is possible to calibrate and integrate flow rate and calories of flowing fluids and to indicate difference in temperature of the fluids at points upstream and downstream of a thermal load by directly detecting the flow rate of the fluids, calculating unintermittently and in relation to the detected flow rate the removal of heat from the fluids through detecting mechanical variations proportional to said difference of temperature and directly transferring said variations onto an indicating means, and wherein it is also possible to

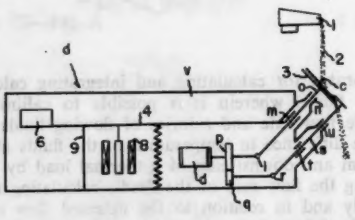
keep an output member constantly rotating in a fixed direction by changing a change-over mechanism provided in the apparatus, so as to make digital wheels rotate in a fixed direction to integrate calories either used for air-cooling or heating always in a positive number without the replacement of temperature detecting means and consequently to indicate whether the system is under air-cooling or heating.

3,613,448
FLUID FLOW MEASURING APPARATUS
James M. Benson and Edmond Easter, Hampton, Va., assignors to Teledyne, Inc., Los Angeles, Calif.
Filed Nov. 26, 1969, Ser. No. 880,237
Int. Cl. G01p *5/14*
U.S. Cl. 73—205 R **9 Claims**



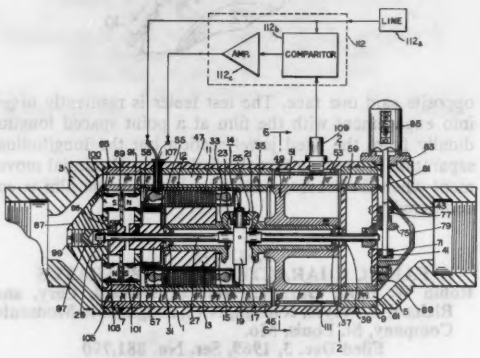
Apparatus for measuring the flow of fluid through a main supply line which has a head element therein to develop a pressure drop. A shunt path having a restrictive element is provided to bridge the head element. The shunt path includes a thermal flowmeter comprising a conduit at least a portion of which is electrically and thermally conductive, the conductive portion having one or more thermoelectric devices positioned therealong. Heating current is passed through the conductive conduit portion, and the temperature gradient caused by fluid flow through the heated conduit is sensed by the thermoelectric devices to provide an indication of mass flow substantially independent of pressure and temperature. A source of purging fluid at high pressure is connected through bleed valves to the shunt path on opposite sides of the thermal flowmeter.

3,613,449
IMPACT FLOW METER FOR POWDERY AND GRANULAR MATERIALS
Tamihiko Soejima, 20–2 Nanan-cho, Showa-ku, Nagoya-shi, Japan; and Hiroshi Kajiura, 1–5, 2-chome, Higashinakano, Nakano-ku; and Kinnosuke Watanabe, 22–8, 3-chome, Nishiochiai, Shinjuku-ku, both of Tokyo, Japan
Filed Aug. 28, 1968, Ser. No. 755,982
Int. Cl. G01f *1/00*
U.S. Cl. 73—228 **7 Claims**



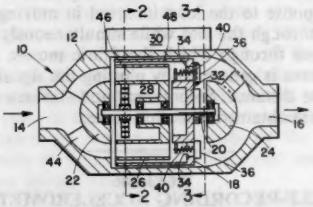
An impact flow meter for powdery and granular materials comprising an impact-receptive detecting plate for receiving a powdery or granular material dropped from a predetermined height and a wiper for keeping the plate clean and preventing deposition of the dropping material, said detecting plate and said wiper being arranged close to each other and made symmetrically operable with respect to each other.

3,613,450
FLUID MASS FLOWMETER
Philip K. Bodge, 45 Abbot St., Andover, Mass. 01810
Filed Apr. 2, 1968, Ser. No. 718,051
Int. Cl. G01f *1/10*
U.S. Cl. 73—231 M **12 Claims**



A fluid mass flowmeter of the angular momentum type utilizes a variable-speed servomotor to drive a fluid-accelerating impeller at a constant speed through a translating unit which causes the torque available at the servomotor to develop a constant-speed output while concurrently providing a variable-speed output the velocities of which are proportional to mass flowrate and the total excursions of which are proportional to mass quantity.

3,613,451
MASS FLOWMETER
Richey L. Scott, Davenport, Iowa, assignor to The Bendix Corporation
Filed Oct. 24, 1969, Ser. No. 869,152
Int. Cl. G01f *3/00;* **F04d** *29/18*
U.S. Cl. 73—231 M **3 Claims**



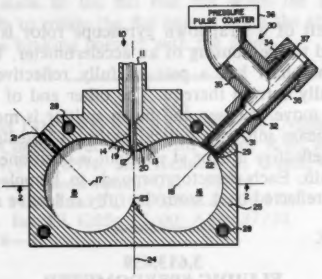
A flowmeter which operates on a time-base angular-momentum principle to provide accurate time-mass gaging of fluid streams of varying density and viscosity. The flowmeter includes a rotatable drive turbine and a rotatable reaction turbine which is mechanically coupled to the drive turbine through a linear spiral spring which causes the reaction turbine to lag the drive turbine by a lag angle which when measured on a time-base produces a signal which is proportional to the mass flow rate of the fluid stream. The drive turbine includes a plurality of bypass

openings which permit flow of the fluid stream therethrough and is provided with a plurality of variable angle turbine blades which are disposed adjacent the bypass openings to progressively permit increased flow through the bypass openings when the pressure drop across the drive turbine exceeds a predetermined value.

3,613,452
CONTROL APPARATUS

Edward G. Zoerb, Bloomington, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed June 30, 1965, Ser. No. 469,972
Int. Cl. G01k *11/22*
U.S. Cl. 73—339 A **4 Claims**

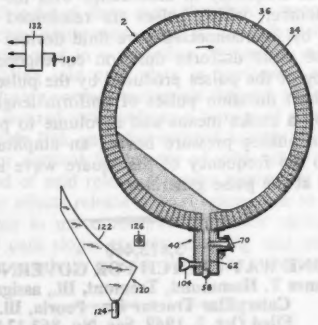


An improved temperature sensitive acoustical fluidic oscillator whose frequency of oscillation and response time depend upon a specially shaped chamber and a specially located exhaust passage together with a system for utilizing the fluidic oscillator output comprising apparatus for converting an oscillating fluid signal into an analog output signal.

3,613,453
ROTARY KILN SAMPLING DEVICE

Kenneth R. Small and John F. Small, Dover, Pa., assignors to The J. E. Baker Company, York, Pa.

Filed Nov. 18, 1969, Ser. No. 877,699
Int. Cl. G01k *13/02, 13/12;* G01n *1/02*
U.S. Cl. 73—351 **12 Claims**

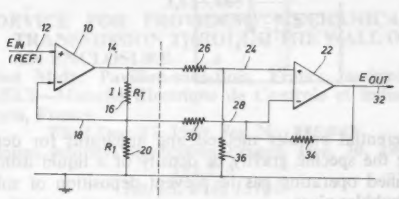


A method and apparatus for measuring the temperature and determining the treatment condition of material undergoing processing in a rotary kiln; the method comprising withdrawing a sample of material undergoing treatment from the rotary kiln, measuring the temperature of the sample, removing from the withdrawn sample a portion and analyzing the removed portion; the apparatus including a ceramic insulation lined sampling chamber affixed to the outer shell of the kiln and having a first passageway in communication with the interior of the kiln, and closed at its opposite end, a second passageway at right angle to said first passageway open at one end into said first passageway, a cover over the opposite end of the second passageway, means for opening and closing the cover, means for measuring the temperature of a sample in the first passageway when the cover is open, a third passageway open at one end into the first passageway, a cover over the opposite end of the third passageway, means for opening and closing the cover on the third passageway and means for receiving a sample of material discharged from the third passageway when the third passageway cover is open.

3,613,454
PLATINUM RESISTANCE THERMOMETER CIRCUIT

Louis W. McFadin, Houston, Tex., assignor to the United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Mar. 16, 1970, Ser. No. 19,572
Int. Cl. G01k *7/20*
U.S. Cl. 73—362 AR **1 Claim**

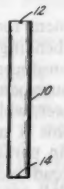


A platinum wire resistor is exposed to a temperature to be measured. The voltage drop across the resistor is input to a differential amplifier. The platinum resistor is connected to ground through a sensing resistor. Variations in voltage across the sensing resistor drives the differential amplifier to maintain a constant current through the resistance thermometer and the sensing resistor. A second differential amplifier connected across the resistive thermometer forms an output signal which is related to the temperature of the sensor and hence, proportional to the measured temperature.

3,613,455
FLUTED TRANSDUCER PRESSURE SENSING MEMBER

Russell E. Hightower, Albuquerque, N. Mex., and Charles B. Aufill, deceased, late of Albuquerque, N. Mex., by Paula J. Watkins, executrix, Albuquerque, N. Mex., assignors to Sparton Corporation, Jackson, Mich.

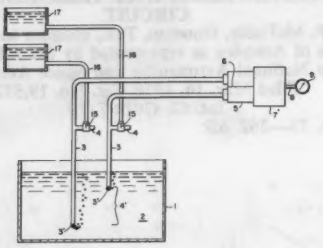
Original application Aug. 19, 1968, Ser. No. 753,791, now Patent No. 3,501,960, dated Mar. 24, 1970. Divided and this application Dec. 8, 1969, Ser. No. 882,965
Int. Cl. G01l *7/04*
U.S. Cl. 73—418 **2 Claims**



The invention pertains to a fluted pressure sensing member utilized with a pressure transducer wherein the pressure sensing member is of a tubular configuration and

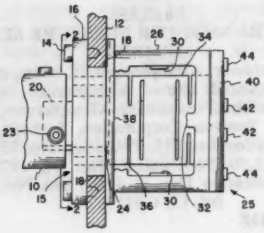
includes spirally formed flutes wherein a pressure differential acting upon either the interior or exterior wall of the sensing member causes a twisting and angular deflection of the member about its longitudinal axis proportional to the pressure differential. The flutes are formed in the member by a deformation of the member materials, usually inwardly, rather than the flutes being formed by the twisting of a noncircular tubular blank as is known.

3,613,456
BUBBLER METHOD AND APPARATUS
Dieter H. Hopfe and William P. Wilson, Sr., Houston, Tex., assignors to Dresser Industries, Inc., Dallas, Tex.
Filed July 25, 1969, Ser. No. 844,781
Int. Cl. G01f *23/14*; G01n *9/28*
U.S. Cl. 73—439 **2 Claims**



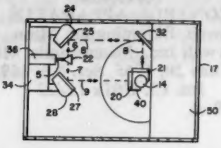
Differential bubbler method and apparatus for determining the specific gravity or density of a liquid using a humidified operating gas to prevent deposition of solids in the bubbler pipes.

3,613,457
ISOLATION COUPLING ARRANGEMENT FOR A TORQUE MEASURING SYSTEM
Thomas O. Paine, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Lawrence P. Davis, James E. Crutcher, and Jerald H. Weidenhamer, all of Phoenix, Ariz.
Filed Nov. 29, 1969, Ser. No. 880,249
Int. Cl. G01l *3/10*; G01c *19/00*
U.S. Cl. 73—133 **7 Claims**



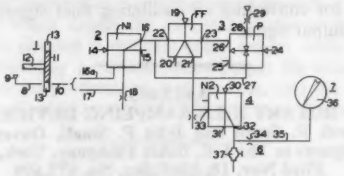
A coupling arrangement for isolating the torque loads from axial, radial, and bending loads in a load path having a torque measuring transducer therein so as to eliminate errors in torque measurement resulting from their imposition on the transducer, while retaining substantial support for these loads. This is attained by the use of a pair of flexures connected in parallel in the load path which have complementary load bearing characteristics, a first one compliant to radial, axial, and bending loads and rigid under torque, the second having opposite characteristics, with the transducer measuring the torque carried by the first flexure.

3,613,458
LASER PICKOFF FOR STRAPDOWN GYROSCOPIC ACCELEROMETER
James V. Johnston and Guilford J. Hutcheson, Jr., Huntsville, Ala., assignors to the United States of America as represented by the Secretary of the Army
Filed Jan. 8, 1970, Ser. No. 1,479
Int. Cl. G01p *15/08*
U.S. Cl. 73—504 **6 Claims**



The shaft of a strapdown gyroscope rotor is attached at one end to the housing of an accelerometer. The other end of the shaft has a pair of fully reflective mirrors orthogonally carried thereon. The other end of the shaft is free to move. A laser and beam splitter is mounted to split the beam into two optical paths. A detector with a partially reflective mirror at its input is positioned in each optical path. Each detector responds to Doppler shift of the beam reflected back from the fully reflective mirror.

3,613,459
FLUIDIC SPEEDOMETER
Ronald A. Sarbach, Columbus, Ohio, assignor to Westinghouse Air Brake Company, Wilmerding, Pa.
Filed June 3, 1968, Ser. No. 734,073
Int. Cl. G01p *3/26*
U.S. Cl. 73—506 **5 Claims**

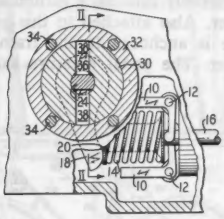


A fluidic speedometer in which a pulse generator produces fluid pressure input pulses in square wave form varying in frequency in accordance with the speed of a given member, which pulses are reinforced and differentiated by interconnected pure fluid devices to produce pulses of short uniform duration corresponding to the frequency of the pulses produced by the pulse generator, which short duration pulses of uniform length are integrated by a choke means and a volume to provide to a gauge an analog pressure having an amplitude proportional to the frequency of the square wave input pulses initiated at the pulse generator.

3,613,460
ONE WAY CLUTCH FOR GOVERNORS
James T. Hammond, Tremont, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.
Filed Oct. 2, 1969, Ser. No. 863,124
Int. Cl. G05d *13/16*
U.S. Cl. 73—543 **3 Claims**

A one way clutch which permits a governor spring to be tensioned upon rotation of a shaft in the governor control linkage but prevents movement of the control linkage by energy stored in the governor spring, the shaft in the control linkage has a disc at its end with a diametrically disposed groove, a second and coaxial shaft has a flat end which extends across said groove. The disc is within

an annular drum and shoes in the grooves extend between the drum and the flat end of the shaft. When the governor control linkage is actuated to rotate the discs, the shoes

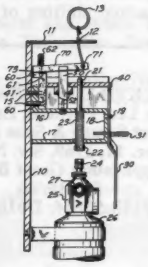


impart rotation to the flat end but when the governor spring tends to rotate the flat end, it urges the shoes outwardly into braking contact with the drum.

3,613,461
CAM LOCKED RELEASE MECHANISM

Roger R. Cholin, Old Stone Hill Road, R.D. 2, Pound Ridge, N.Y. 10576, and Kenneth E. Guest, 43 Bainbridge Ave., Thornwood, N.Y. 10594

Filed Jan. 27, 1970, Ser. No. 6,079
Int. Cl. G05g *17/00*; A62c *37/26*
U.S. Cl. 74—2 **3 Claims**



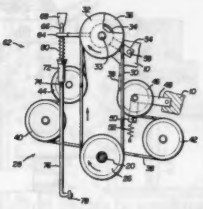
This invention relates to a spring loaded cam locked release mechanism used for fire extinguishers. The mechanism comprises a spring loaded cam plate having an actuating bolt fixed thereto and adapted to unseat a valve on a fire extinguisher; a release bar having a stud on the top thereof for abutment and a pair of spaced-apart integral inclined slope cams therebelow upon which slopes said cam plate rests when in cocked position; a guide plate disposed in a co-acting channel in said cam plate for holding said cam plate in horizontal position at all times during vertical movement thereof; and a cable retainer bar secured swingably to a tensioned steel cable having a fusible link and also secured loosely to a hand pull cable for vertical movement of said cable retainer over said stud of said release whereby movement of said cable retainer effects release of said release bar to permit said cam plate to move downwardly under spring pressure on said cam slopes thereby allowing said actuating bolt to strike a release pin to unseat the valve on a fire extinguisher.

3,613,462
DRIVE BELT ASSEMBLY FOR TRACTOR MOUNTED IMPLEMENT

Paul H. Stibbe, Neenah, Wis., assignor to J. I. Case Company, Racine, Wis.

Filed June 10, 1970, Ser. No. 44,916
Int. Cl. F16h *37/02, 7/10*
U.S. Cl. 74—15.4 **11 Claims**

A PTO belt drive assembly includes an engine driven pulley which drives a twin pulley assembly comprising the power take-off for an implement and which is supported for rotation on a pivotally mounted countershaft; the pivotally mounted countershaft is loaded in the direction of the belt drive for rotation around its pivot to tension the belt-engagement around the pulleys and is

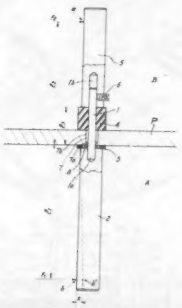


provided with a release and clutch linkage arrangement to pivot the countershaft carrying the twin PTO drive pulleys in the opposite direction of the belt drive to thereby disengage the twin PTO pulleys from the engine drive.

3,613,463
DEVICE FOR PROVIDING MECHANICAL TRANSMISSION THROUGH THE WALL OF AN ENCLOSURE

Michel Midy, Pavillon-sous-Bois, France, assignor to MECI—Materiel Electrique de Controle et Industriel, Paris, France

Filed Dec. 17, 1969, Ser. No. 885,945
Claims priority, application France, Dec. 30, 1968, 182,274
Int. Cl. F16j *15/50*
U.S. Cl. 74—18.1 **8 Claims**



A device providing mechanical transmission through the wall of an enclosure, comprising a passage in the wall the inner end of which passage terminates at a reduced diameter circular lip which encircles with substantially line contact a transmission rod which extends through the passage and is capable of tilting therein, and a resilient sealing member disposed and retained against the inner surface of the enclosure wall around the rod to seal the passage.

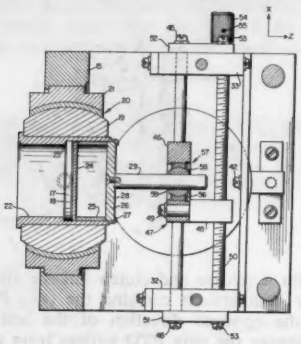
3,613,464
APPARATUS FOR ORIENTING BEAM DIRECTING OR VIEWING APPARATUS

Robert L. Archer, 17 Wren Drive, Woodbury, N.Y. 11797

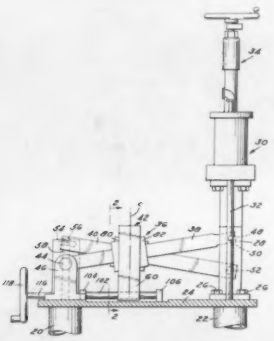
Filed Oct. 2, 1969, Ser. No. 863,277
Int. Cl. F16c *1/00*; F16h *27/02*
U.S. Cl. 74—89.15 **11 Claims**

Apparatus for orienting a beam directing or viewing device having means for rotatably mounting the sensitive element of the device at the geometrical center of a

spherical bearing. One end of a linkage arm is directly or indirectly connected to the device and the other end is then coupled to a mechanism which limits its motion to translation along either of two mutually orthogonal reference axes. Translation along either one of the two reference axes will cause the sensitive element to be rotated about the corresponding orthogonal axis without cross-coupling therebetween.



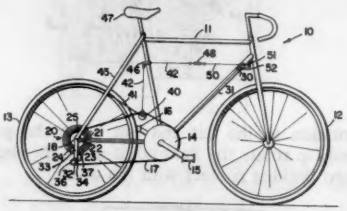
3,613,465
RATIO LINKAGE ASSEMBLY
Fred M. Wood, Orchard Lake, Mich., assignor to Pyles Industries, Inc., Wixom, Mich.
Filed Dec. 9, 1969, Ser. No. 883,569
Int. Cl. F16h *21/44*
U.S. Cl. 74—110 **4 Claims**



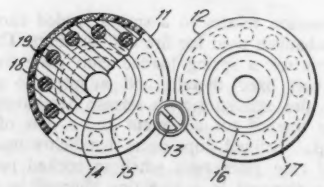
A linkage assembly for driving a pair of reciprocable elements conjointly, including means for selectively varying the stroke ratio between the elements, comprising two lever arms each connected at one end to a respective reciprocable element and at the other end to a support, mechanism coupling the lever arms together for swingable movement about a common vertically slidable pivot while permitting slight longitudinal shifting between the arms, and motor means connected to one of the arms and operable to swing the arms to reciprocate the elements.

3,613,466
AUTOMATIC GEARSHIFT FOR BICYCLE
George F. Houghton, 650 Gerona Road, Stanford, Calif. 94305
Filed June 22, 1970, Ser. No. 48,012
Int. Cl. F16h *9/00, 11/06*
U.S. Cl. 74—217 B **12 Claims**

A bicycle having a manually operated gearshift is converted to an automatic shift dependent upon the pedal pressure used to propel the bicycle. The drive chain engages a special shift-control wheel which is attached to a first cable that goes to the frame and to a second cable that goes up vertically, then turns horizontally, and is attached, preferably through a turnbuckle, to the manual gearshift lever. Also attached to this gearshift lever is a spring which is anchored to the frame forward of the gearshift lever. The pedal pressure exerted through the drive chain tends to pull the special shift-control wheel down and to pull the shift lever back; this pressure is opposed by the spring attached to the gearshift lever, which tends to pull the shift-control wheel up and to pull the shift lever forward. Thus the amount of effort needed to move the drive chain acts to vary the position of the gearshift lever. The gearshift lever operating through its usual shift mechanism, such as a typical derailleur, does the actual shifting of the gears.



3,613,467
TEXTILE APPARATUS
Harold William Lee, Poynton, England, assignor to Ernest Scragg & Sons Limited
Filed Dec. 11, 1969, Ser. No. 884,180
Claims priority, application Great Britain, Dec. 12, 1968, 59,115/68
Int. Cl. F16h *55/34;* **D01h** *7/46, 7/92*
U.S. Cl. 74—215 **15 Claims**

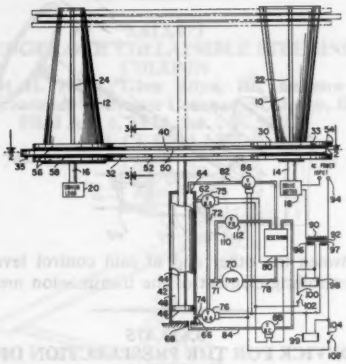


A roller for driving a false twist spindle has a rigid core surrounded by a coating of moldable material which is reinforced by high-tenacity material in whisker form.

3,613,468
CONTINUOUSLY VARIABLE TRANSMISSION SYSTEM EMPLOYING SEGMENTED PULLEYS
Sydney Rand, G.P.O. 2034, San Juan, Puerto Rico 00936
Filed July 22, 1970, Ser. No. 57,173
Int. Cl. F16h *9/16*
U.S. Cl. 74—217 CV **10 Claims**

A mechanical transmission system includes axially parallel conical members on which are longitudinally slidable pulley segments constituting composite pulleys drivingly engaged by one or more drive belts. Simultaneous movement of the pulley segments and belt changes the ratio of pulley diameters as the pulley segments move longitudinally and radially of the conical members. Means for shifting the pulley segments and belt simultaneously is provided. A drive motor and driven load can be coupled to the conical members. Control means responsive

to the magnitude of power drawn by the drive motor in response to change in the load automatically actuates the

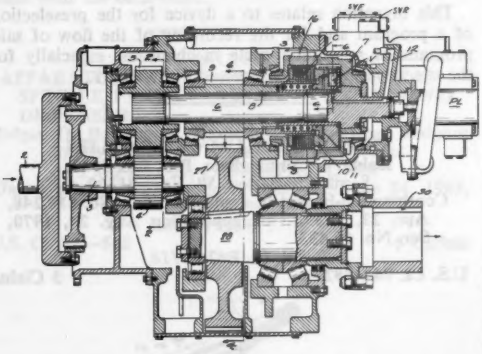


shifting means to position the pulley segments for setting an optimum ratio of pulley diameters.

3,613,469
POWER TRANSMISSION OF THE HYDRAULICALLY ACTUATED, FRICTION CLUTCH TYPE

Richard C. McRoberts and Bruce C. Arnold, Racine, Wis., assignors to Twin Disc, Incorporated, Racine, Wis.

Filed Apr. 29, 1970, Ser. No. 32,914
Int. Cl. F16h *3/08, 3/14*
U.S. Cl. 74—361 **15 Claims**



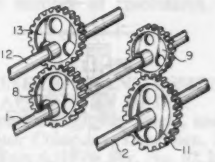
A power transmission including forward and reverse shafts each having a hydraulically actuated clutch which is controlled by a centrifugal valve. The transmission finds particular utility in regulating the speed, rotational direction, and power delivered to the propulsion drive in a marine vessel.

3,613,470
GEAR TRANSMISSION MECHANISM OF A WEAVING LOOM

Kazuyuki Arakawa, Kanazawa-shi, Japan, assignor to Tsudakoma Industrial Co., Ltd., Kanazawa-shi, Ishikawa-ken, Japan

Filed Aug. 22, 1969, Ser. No. 852,335
Claims priority, application Japan, Sept. 7, 1968, 43/77,339
Int. Cl. F16h *35/02*
U.S. Cl. 74—393 **2 Claims**

In a transmission of rotation from a driving shaft of constant rotation to a driven shaft on a weaving loom using a gear train, time-functional rotation speed change of the latter within one rotation cycle of the former is attained by insertion into the gear train of a combination

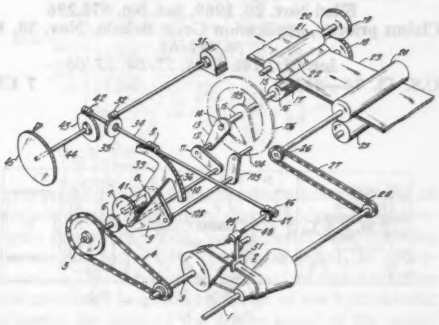


of gears of elliptical pitch circles, a combination of gears eccentrically mounted on the shafts, or a combination of elliptically profiled gears with eccentrically mounted gears.

3,613,471
COUNTERBALANCING MEANS FOR CUTOFF KNIVES

Albert F. Shields, Forest Hills, N.Y., assignor to S & S Corrugated Paper Machinery Co., Inc., Brooklyn, N.Y.

Filed Oct. 20, 1969, Ser. No. 867,486
Int. Cl. B23d *25/02;* **F16h** *35/02*
U.S. Cl. 74—393 **15 Claims**



A kinematic or quadric chain type adjustable speed knife driving mechanism is provided with a counterbalancing means freely rotated on the shaft which directly drives the knife bars. The drive arms or links for the knife bars and the counterbalancing means are driven at speeds which vary cyclically within each revolution of the knife bar, with the arm driving the counter balancing link arranged to push the counterbalance while the arm driving the knife bars is arranged to pull the knife crank. The driving pins connecting the counterbalance and knife crank to the input power source are spaced apart by an angular distance in the order of 60–90 degrees, with the pin for the counterbalance drive arm leading the pin for the knife bar drive arm.

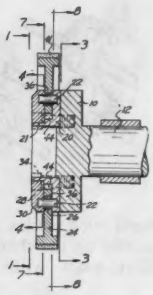
3,613,472
HONING GEAR ASSEMBLY

Gerhard R. Held, 22644 Shiell Drive, Mount Clemens, Mich. 48043

Filed Aug. 12, 1970, Ser. No. 63,121
Int. Cl. F16h *55/12;* **B24b** *41/00;* **B24d** *5/00*
U.S. Cl. 74—411 **3 Claims**

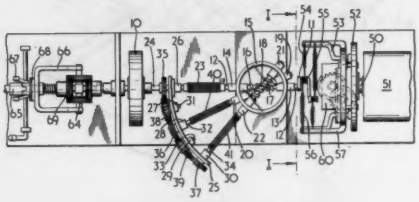
A honing gear assembly comprising a backing plate, a gear plate, and a cover plate, all bolted together, and mounted on a drive spindle hub, with pin and bushing

connections between the backing plate and the gear plate, with the pins of such connections being received in blind sockets of the cover plate, with the holes of the gear plate



being lined with shock absorbing bushings for absorbing shocks transmitted for the gear plate to the backing plate and thus to the drive spindle hub.

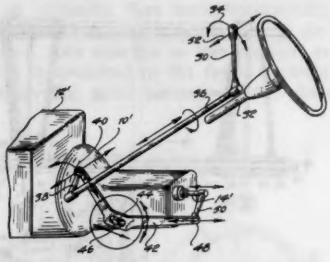
3,613,473
UNIDIRECTIONAL DRIVE ELEMENT
Roy Cyril Vaughan, Dublin, Ireland, assignor of a fractional part interest to Alan Salisbury Lamburn, Gloucestershire, England
Filed Nov. 20, 1969, Ser. No. 878,296
Claims priority, application Great Britain, Nov. 30, 1968, 56,952/68
Int. Cl. F16h *1/08, 27/04, 57/00*
U.S. Cl. 74—424.5 **7 Claims**



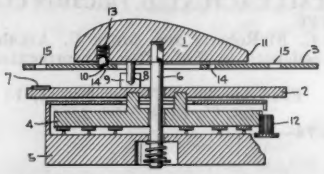
A unidirectional drive element, such as a free-wheel, includes a pair of meshing toothed members, for example worm gears of the same hand, and bias means urge the teeth of the gears together in one direction so that they jam when an attempt is made to rotate one gear in such a direction that its teeth move towards the contacting teeth of the other gear, but the bias means prevents the flanks on the opposite sides of the teeth from contacting so that they do not jam in the opposite direction of rotation.

3,613,474
TRANSMISSION RATIO CONTROL LINKAGE MECHANISM
Paul Baumgarti, Sao Paulo, Brazil, assignor to Ford Motor Company, Dearborn, Mich.
Filed July 17, 1970, Ser. No. 55,802
Int. Cl. G05g *9/18*
U.S. Cl. 74—484 **8 Claims**

A transmission ratio control linkage mechanism for an automotive vehicle comprising a gearshift lever mounted for rotation and for reciprocation on the vehicle's steering column, a control lever mounted for oscillation about a movable axis whereby angular motion as well as translatory motion is permitted, a motion transmitting connection between the gearshift lever and one end of the control lever and another motion transmitting connection between the other end of said control lever and a ratio controlling element of the transmission mechanism.

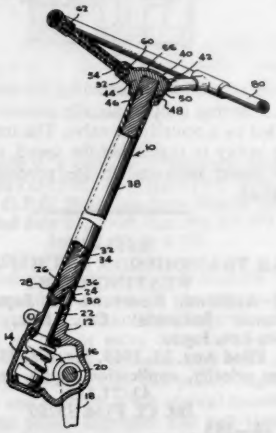


3,613,475
DEVICE FOR THE PRESELECTION OF A PROGRAM
Walter Holzer, Meersburg, Germany, assignor to Holzer Patent AG, Zug, Switzerland
Filed Feb. 12, 1970, Ser. No. 10,958
Claims priority, application Germany, Feb. 15, 1969, P 19 07 725.9
Int. Cl. H01h *43/14;* **G05g** *1/00*
U.S. Cl. 74—491 **3 Claims**



This invention relates to a device for the preselection of a program and for the recording of the flow of said program of automatic cycle mechanisms, especially for the use in washing machines and dishwashers.

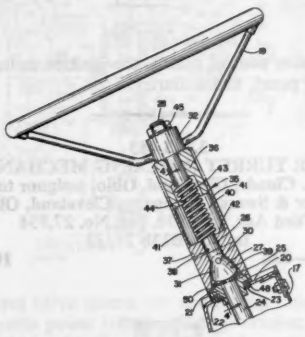
3,613,476
STEERING COLUMN ASSEMBLIES
Isaiah V. Cunningham, P.O. Box 9337, South Charleston, W. Va. 25303
Continuation-in-part of application Ser. No. 818,248, Apr. 22, 1969. This application Aug. 24, 1970, Ser. No. 66,433
Int. Cl. B62d *1/18*
U.S. Cl. 74—492 **3 Claims**



Steering assemblies comprise columns, wheels and spokes, for motor vehicles or the like and are constructed

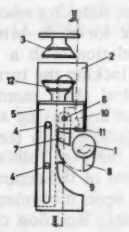
principally from heavy wire or cable which is flexible upon impact to prevent injuries. The assembly components are coated with plastic.

3,613,477
WEDGE-LOCK COLLAPSIBLE STEERING COLUMN
Robert H. Heise, Glen Ellyn, Ill., assignor to International Harvester Company, Chicago, Ill.
Filed July 6, 1970, Ser. No. 52,276
Int. Cl. B62d *1/18*
U.S. Cl. 74—493 **14 Claims**



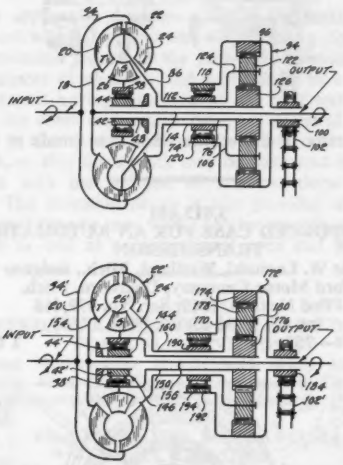
A steering column adaptable for use as a component of a steering assembly for riding mowers, the column including a pair of shafts having adjacent ends hingedly connected by a mating clevis arrangement and telescoping collars one of which fits around the clevis arrangement and is operative to tightly wedge the shafts in axial alignment with the each other.

3,613,478
APPARATUS FOR TEMPORARILY LOCKING A SPINDLE, PARTICULARLY IN A HAND TOWEL DISPENSER
Holger O. Rasmussen, Kilchberg, Switzerland, assignor to CWS Apparate AG, Zurich, Switzerland
Filed June 10, 1970, Ser. No. 45,021
Claims priority, application Switzerland, June 24, 1969, 9,632/69
Int. Cl. G05g *5/00*
U.S. Cl. 74—565 **5 Claims**



There is disclosed an arrangement for temporarily locking a spindle, particularly in a hand towel dispenser, after two or more complete revolutions for a period of time determined by a suction cup held by suction against a counter element. The suction cup is carried on a movable member and it cooperates with the counter element when the movable member is in an end position in which it stops the spindle. During a first revolution of the spindle a cam piece connected to the spindle engages a first abutment on said member for moving the latter from a starting position into an intermediate position in which it is retained by a pawl mechanism. During at least one succeeding revolution of the spindle said cam piece engages at least one further abutment on said member for moving it into further intermediate positions and finally into its end position. Limiting means may be provided for selectively preventing complete restoration of said member to its starting position so that the spindle is then locked after fewer than a maximum number of resolutions.

3,613,479
HYDROKINETIC TRANSMISSION AND ACCESSORY DRIVE
Karl J. Borneman, Detroit, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed July 6, 1970, Ser. No. 52,233
Int. Cl. F16h *47/00, 47/08*
U.S. Cl. 74—688 **7 Claims**

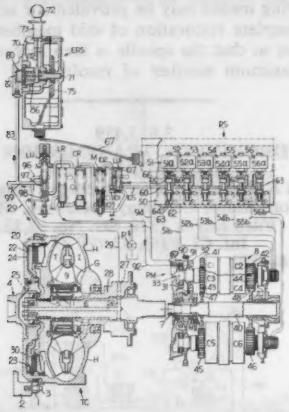


A hydrokinetic power transmission mechanism for an automotive vehicle including an accessory drive for powering engine driven accessories, said accessory drive having an input member connected to one member of the hydrokinetic unit in the transmission mechanism and a reaction member connected to another member of the hydrokinetic unit whereby the ratio of the driven speed of the accessory drive to the speed of the power input member for the accessory drive is decreased when the hydrokinetic unit approaches a coupling condition.

3,613,480
POWER TRANSMISSION HAVING DOWNSHIFT INHIBITOR
Bradford K. Shull, Rockford, Ill., assignor to Twin Disc, Incorporated, Racine, Wis.
Filed July 13, 1970, Ser. No. 54,316
Int. Cl. F16h *3/44, 33/00, 67/00*
U.S. Cl. 74—733 **6 Claims**

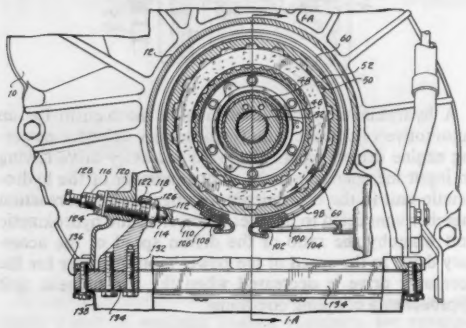
A transmission of the type having a torque converter that can be engaged in direct drive through a direct drive clutch whenever the speed of the engine is at a rated speed, and in which the transmission should not be downshifted if it is operating at too fast a speed because of possible damage to the engine and transmission. A downshift inhibitor is provided for such a transmission and includes a fluid actuated brake and a one-way clutch connected with the speed selector shifting lever whereby the lever can be shifted in the upshift direction but the brake retards the lever against downshifting when the transmission is operating over a predetermined speed. The fluid brake on the downshift inhibitor is actuated by the same fluid pressure that actuates the direct drive clutch. Thus,

the downshift inhibitor includes a one-way clutch and a fluid brake that work together automatically to indicate



to the operator of the vehicle when it is unsafe to downshift.

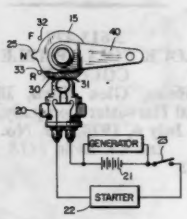
3,613,481
REINFORCED CASE FOR AN AUTOMATIC TRANSMISSION
Charles W. Lapinski, Westland, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed Nov. 24, 1969, Ser. No. 879,468
Int. Cl. F16d *65/06*; F16h *57/08*
U.S. Cl. 74—753 **2 Claims**



A case for an automatic power transmission in an automotive vehicle driveline, said transmission including a reaction brake band for selectively anchoring a torque reaction gear element in the transmission, a stiffener plate secured to the base of the transmission, a reaction shoulder bolted to said torque reaction plate and means for transferring torque reaction from the brake band to the case through the stiffener plate thereby avoiding flexure of the case.

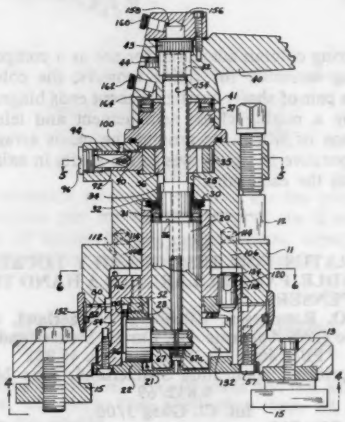
3,613,482
FORWARD-REVERSE SELECTOR WITH STARTER SWITCH
Carl Ivar Benson, Jr., Westwood, and James Rapoza, Fall River, Mass., assignors to Paragon Gears, Incorporated, Taunton, Mass.
Filed Mar. 27, 1970, Ser. No. 23,168
Int. Cl. F02d *11/00*
U.S. Cl. 74—850 **1 Claim**

A system is provided for preventing the starting of a marine engine when the transmission control means is in any position other than neutral. A series electrical circuit is provided which includes a power source (battery), a neutral start switch operatively associated with



the transmission control means, the ignition switch in the boat control panel, and a starter.

3,613,483
SQUARE TURRET INDEXING MECHANISM
Frank A. Cinadr, Cleveland, Ohio, assignor to The Warner & Swasey Company, Cleveland, Ohio
Filed Apr. 13, 1970, Ser. No. 27,934
Int. Cl. B23b *29/32*
U.S. Cl. 74—824 **10 Claims**



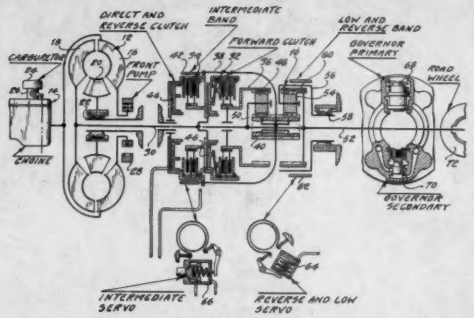
An improved turret indexing mechanism for selectively rotating an indexible turret to bring tools held thereby into an operative relation with a workpiece includes a Curvic coupling for locking the turret in a selected angular position. A central shaft member operatively associated with the turret and having a cam follower affixed thereto which is rotatable with the central shaft, and a cam track in which the cam follower rotates and which effects axial movement of the central shaft and the turret associated therewith upon movement of the cam follower through the cam track. Rotation of the central shaft in one direction raises the turret to disengage the teeth of the Curvic coupling and indexes the turret. Rotation of the central shaft in the opposite direction lowers the turret and engages the teeth of the Curvic coupling to thereby lock the turret in a selected position. The indexing mechanism also includes stop means which normally limit the rotation of the turret so that the turret may only be rotated to its next operative position. This construction enables the turret to be rapidly and efficiently unlocked, automatically indexed to a new position, and then locked in the new position with a sufficient force so that inadvertent rotation of the turret out of the new position will not occur due to vibration of the turret.

3,613,484

RATIO SHIFT TIMING VALVES FOR USE IN A CONTROL SYSTEM FOR A MULTIPLE RATIO AUTOMATIC POWER TRANSMISSION MECHANISM

Stanley L. Pierce, Birmingham, and William C. Winn, Inkster, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 8, 1969, Ser. No. 883,061
Int. Cl. B60k *21/10*
U.S. Cl. 74—869 10 Claims



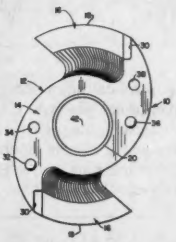
A control valve system for controlling ratio shifts in a multiple ratio power transmission mechanism in an automotive vehicle driveline having fluid pressure operated clutch and brake servos for controlling ratio shifts, said system comprising a valve assembly for controlling the rate of engagement of one servo during a ratio change from the lowest speed ratio to an intermediate speed ratio and for controlling the clutch and brake engagement and release pattern when a down shift from the high speed ratio to an intermediate speed ratio occurs in response to increased torque demand at low vehicle speeds, and a separate valve assembly for controlling corresponding torque demand downshifts when the vehicle is operated in a relatively high speed range.

3,613,485

METHOD OF FABRICATING A CUTTTER

Hubert K. Kelly, Clay, Thomas J. McDonnell, Syracuse, and Richard C. Lamkin, Skaneateles, N.Y., assignors to Rockwell Manufacturing Company, Pittsburgh, Pa.

Original application Aug. 1, 1967, Ser. No. 657,647, now Patent No. 3,491,422, dated Jan. 27, 1970. Divided and this application Aug. 12, 1969, Ser. No. 862,574
Int. Cl. B21k *21/00*
U.S. Cl. 76—101 A 4 Claims



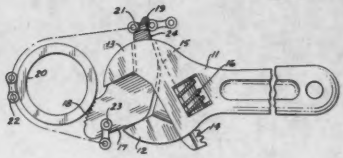
A cutter head including a laminate of platelike elements joined into a unitary structure. The elements define a continuous cutting edge extending the length of the cutter or a similarly dimensioned seat for a separate cutting edge member. An element locating and positioning arrangement angularly indexes each element relative to the element or elements thereadjacent to provide a cutting edge or seat of specified configuration.

3,613,486

PIPE WRENCH ADAPTER

William C. Chapman, 6061 Brighton Road, Brighton, Mich. 48116

Filed Jan. 2, 1970, Ser. No. 286
Int. Cl. B25b *13/52, 13/58*
U.S. Cl. 81—180 2 Claims



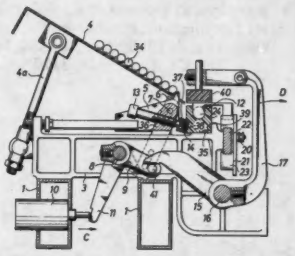
This application discloses a device for making a conventional, adjustable, open end wrench into a pipe wrench. The invention resides in the particular combination and arrangement of elements and particularly in a flat plate like element having serrations at one end, and a curved lip at the other end, which device is designed to be received in the slotted end of a conventional open end wrench, so that the wrench may be converted into a pipe wrench with the addition of a conventional sprocket chain. The invention device is also provided with means whereby it may be used with a ratchet wrench, or a socket wrench as well as a conventional open end wrench.

3,613,487

FEEDING APPARATUS FOR ROD STOCK FOR A MACHINE TOOL

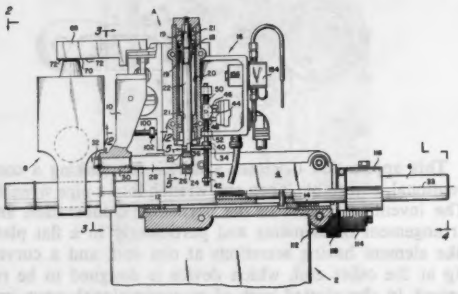
Johannes Werkmeister, Reichenbach (Fils), and Holger Scheler, Faurndau, Germany, assignors to Firma Traub Vertriebsgesellschaft mbH., Reichenbach (Fils), Germany

Filed Mar. 3, 1969, Ser. No. 803,614
Int. Cl. B23b *13/00*
U.S. Cl. 82—2.7 8 Claims



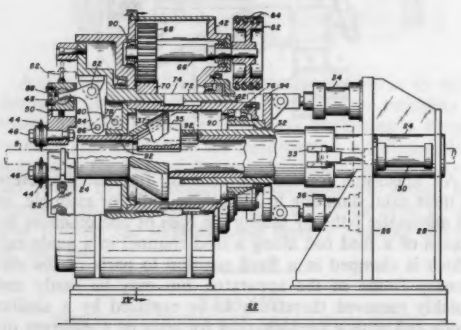
An apparatus for feeding rods of different diameters in their axial direction to a machine tool, for example, to an automatic lathe by sliding the rods of one diameter by means of a feed rod along a feed channel in a guide rail which is clamped in a fixed position to parts of the stationary frame of the apparatus, but may be easily and quickly removed therefrom to be replaced by a similar guide rail with a feed channel for rods of a different diameter. The feed channel is open at its upper side which is normally covered by a cover bar which may be pivoted off this side to permit another rod of the same diameter to be inserted into the empty feed channel after the previous rod has been consumed and the feed rod has been withdrawn from the channel. The feed rod and the means for moving and guiding it may be adjusted to different levels in accordance with the width of the feed channel and the diameter of the rods to be fed.

3,613,488
AUTOMATIC POSITIONING DEVICE FOR A LATHE THREADING ATTACHMENT
Hubert J. Parsons, Horseheads; Francis D. Catlin, Horseheads, and James Cordier, Erin, all of N.Y., assignors to Hardinge Brothers Inc., Elmira, N.Y.
Filed Sept. 3, 1969, Ser. No. 854,908
Int. Cl. B23b 5/46
U.S. Cl. 82—5.5 17 Claims



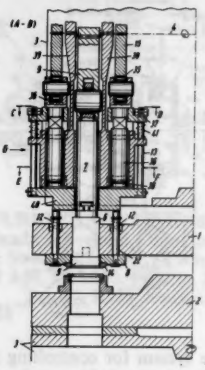
A device for automatically positioning a threading attachment for a lathe having a spindle including a lead screw mounted on said spindle; a rotatable bar mounted on said lathe and extending parallel to the spindle; a follower connected with the bar and movable into mesh with the lead screw for imparting lengthwise motion to the bar; a head secured to the bar; a cutting tool mounted on the head; an arm secured to the bar; a bearing supported means on the lathe for supporting the bar; the arm, bar, and head each having operative and inoperative positions; power means connecting the bearing support means to the arm for rotating the arm, bar and head about the axis of the bar between the operative and inoperative positions, and means for actuating the power means.

3,613,489
METHOD AND APPARATUS FOR SEVERING TUBES
Erasmus A. Randich, Pittsburgh, Pa., assignor to Allegheny Ludlum Steel Corporation, Pittsburgh, Pa.
Filed Aug. 4, 1969, Ser. No. 854,349
Int. Cl. B23b 3/04, 1/00
U.S. Cl. 82—70.2 11 Claims



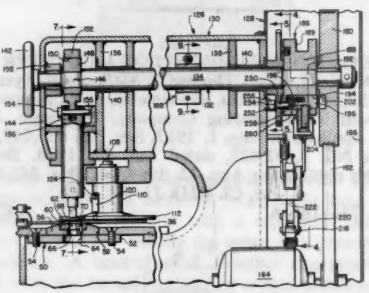
The application describes a method and apparatus for accurately severing tubes and pipes, preferably with a burr-free cut. Tubes are clamped into position and severed by means of cutters. The cutters and tubes are in relative revolvement. Clamping is preferably done in a manner which exerts a tensile stress in the axila direction of the tube. The tensile stress substantially precludes burr formation. A preferred cutter is an edge tool with a rounded cutting edge.

3,613,490
PUNCHING PRESSES
Walter Bredow, Alfeld (Leine), Ziegelmasch, Germany, assignor to C. Behrens Aktiengesellschaft, Alfeld (Leine), Germany
Filed Feb. 18, 1969, Ser. No. 800,160
Claims priority, application Germany, Feb. 24, 1968, B 96807
Int. Cl. B26d 7/06, 5/42
U.S. Cl. 83—132 12 Claims



A punching press comprising transmission means having an energy-absorbing resilient portion adapted to be compressed during a punching operation after the stripper assembly contacts a workpiece to be punched.

3,613,491
PUNCHING MACHINE
Manfred Kahmann, 1520½ Birchwood, Chicago, Ill.
Filed Sept. 15, 1969, Ser. No. 857,872
Int. Cl. B26d 7/16
U.S. Cl. 83—146 10 Claims

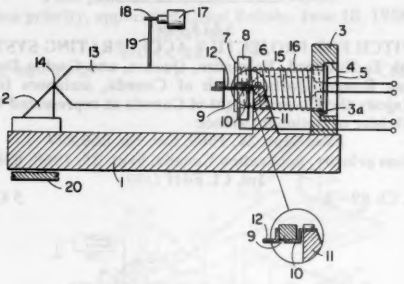


A stylus template-duplicating punching machine having, in addition to a conventional pin-type clutch arrangement for releasably interconnecting the driving flywheel and driven clutch collar, a secondary clutch mechanism which permits the rotation of the crankshaft and clutch collar through a 360° arc while the flywheel is rotating at full speed.

3,613,492
MICROTOME
Lars Olof Anton Soderkvist, Vallingby, Sweden, assignor to LKB-Produkter AB, Bromma, Sweden
Filed June 16, 1969, Ser. No. 833,546
Claims priority, application Sweden, July 2, 1968, 9129/1968
Int. Cl. B26d 7/10
U.S. Cl. 83—170 6 Claims

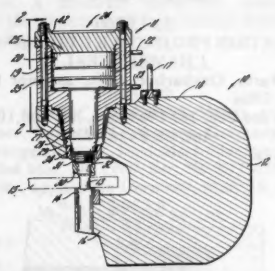
A microtome comprises a holder for a specimen to be cut, a knife for cutting the specimen, a means to impart the

holder with a cutting movement in relation to the knife, and a means to impart the holder with a feeding movement in relation to the knife. The feeding means consists of an expansion body provided with a heating means. A thermostat



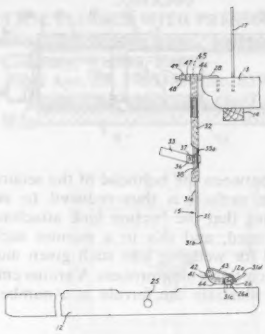
is arranged on the expansion body to regulate the power supplied to the heating means. This regulated supply of power to the heating means makes it possible for the expansion body to maintain a constant temperature, so that the expansion body neither expands nor contracts.

3,613,493
PUNCH PRESS
Harry Conn; Robert W. Mauk, and Paul M. Lancaster, all of Rockford, Ill., assignors to W. A. Whitney, Rockford, Ill.
Filed Dec. 1, 1969, Ser. No. 881,026
Int. Cl. B26d *5/12*
U.S. Cl. 83—639 **8 Claims**



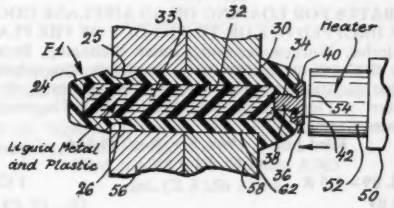
For perforating a workpiece, a press with a two-way fluid operated actuator which is mounted on a support and is operable to reciprocate a punch through a hole in the support into and out of the workpiece. The actuator comprises a cylinder, a cap, a piston, and a ram with a ram guide formed integrally with the cylinder, and the cap and the cylinder are joined together and mounted on the support by studs which are threaded on the opposite end portions. To distribute both the stretching due to the tightening stress on the studs more uniformly over the entire length of the studs, each stud is formed with a center portion of reduced diameter, this diameter being no greater than the root diameter of the threaded end portions. The studs extend through fastener holes in the cap, the cylinder, and the support. So that these holes can be drilled in the separate pieces and then be easily aligned when the press is assembled and mounted on the support, guide holes of equal diameter are formed in the cap, the cylinder, and the support thus allowing the same template to be used to drill the fastener holes in each piece around the guide hole in that piece.

3,613,494
ADJUSTABLE KEYBOARD-TRANSPOSING ADAPTER AND INSTRUMENT
Jae P. Rogers, 1186 Yost St., Aurora, Colo.
Filed May 14, 1970, Ser. No. 37,281
Int. Cl. G10c *3/12*
U.S. Cl. 84—448 **17 Claims**



In a keyboard instrument transposing adapters are provided to releasably connect between the key levers and the sound-actuating mechanisms so that a musical selection played in a key according to the key levers on the keyboard is transposed to produce sounds of a different key. Each adapter has members arranged for extensible and retractable sliding movement therebetween to adjust to a variety of distances between different key levers and sound-actuating mechanisms with a locking lever being operatively associated with the slidable members to hold them against further relative movement once the desired length is established. A plurality of the transposing adapters are arranged generally parallel to one another in the instrument and they extend upwardly on a diagonal to either side from the attachment at the key lever to the actuating mechanism.

3,613,495
FASTENER MEANS INCLUDING AN INTERIOR EXPANSIBLE CORE
Henry J. Podgursky, 64 Reyam Road, Lynbrook, N.Y.
Filed Aug. 6, 1969, Ser. No. 847,986
Int. Cl. F16b *13/04*
U.S. Cl. 85—65 **5 Claims**

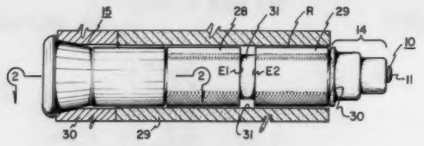


A hollow rivet includes a casing containing an expansible core which when heated or subjected to pressure deforms the casing to lock apertured parts together. The core contains a thermosetting resin plastic, and a metal substance dispersed throughout the core to increase thermal conductivity of the core to facilitate setting of the resin plastic and to increase rigidity of the core when the resin plastic sets.

3,613,496
FERRULE-TYPE FRICTION LOCK DEVICE
Lee Triplett, 2878 South 860 West, Magna, Utah
Filed Mar. 25, 1970, Ser. No. 22,494
Int. Cl. F16b *13/06*
U.S. Cl. 85—69 **9 Claims**

The present invention comprises a friction lock attachment device for use in releasably attaching a given member to a

support, and this in a manner such that the attaching device need not be disassembled for mounting purposes or manipulated at its rear threaded connection. In the device, a unique ferrule is employed, the reacting surface of which, abutting the shouldered surface of a bolthead, is chamfered or tapered such that only the inner circumferential edge of said surface engages the undersurface of the bolthead used.



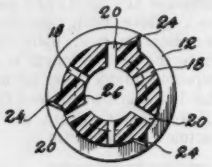
Bearing friction between the bolthead of the securement bolt and such ferrule surface is thus reduced to an absolute minimum, ensuring that the friction lock attachment device is properly tightened, and this in a manner such that the ferrule, designed for wedging into such given member, will not turn upon such tightening process. Various embodiments of the invention illustrate the ferrule in a number of useful forms.

3,613,497

EXPANSION ANCHOR

James F. Heldermann, York, Pa., assignor to U.S. Expansion Bolt Company, York, Pa.

Filed Apr. 10, 1969, Ser. No. 814,912
Int. Cl. F16b *13/06*
U.S. Cl. 85—84 **1 Claim**



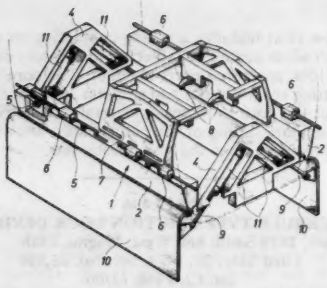
An expansion anchor for wood screws and the like having a plurality of spaced longitudinal slots and a plurality of longitudinal ribs disposed asymmetrically between the slots. The slots extend alternately to the head and to the tip of the anchor.

3,613,498

APPARATUS FOR LOADING ON AN AIRPLANE GOODS TO BE DROPPED OFF OR TILTED OUT OF THE PLANE

Rolf Riccius, Worpswede, and Gunter Weitkamp, Bremen, both of Germany, assignors to Vereinigte Flugtechnische Werke Gesellschaft mit beschrankter Haftung fruher "Weser" Flugzeugbau/Focke-Wulf/Heinkel-Flugzeugbau, Bremen, Germany

Filed Jan. 7, 1969, Ser. No. 789,516
Int. Cl. F41f *5/02*
U.S. Cl. 89—1.5 R **1 Claim**



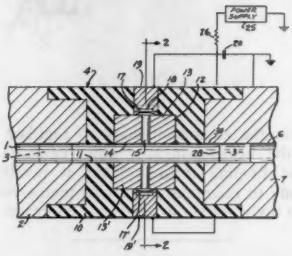
An apparatus for loading loads on an airplane which are releasable from the airplane when the latter is in flight, which includes frame means detachably arranged in a loading chamber in the fuselage of an airplane preferably within the region of the center of gravity of the airplane, while said frame means has displaceably mounted thereon carriage means for suspending a load thereon, said carriage means being adapted to be locked to said frame means in a desired position of said carriage means on said frame means.

3,613,499

SWITCH FOR PROJECTILE-ACCELERATING SYSTEM

Frank T. Hubbard, Valcartier, Quebec, and Gaston Demers, Gap Rouge, Quebec, both of Canada, assignors to Her Majesty the Queen in right of Canada as represented by the Minister of National Defence

Filed Sept. 24, 1969, Ser. No. 860,677
Claims priority, application Canada, Sept. 25, 1968, 030,894
Int. Cl. F41f *1/00*
U.S. Cl. 89—8 **5 Claims**



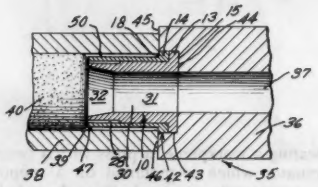
An apparatus for accelerating a projectile through the barrel of a weapon is provided by a plurality of spaced-apart stations or sections along the barrel which are responsive to the passage of the projectile and cause an electrical discharge whereby enthalpy at each station is added to the expanding gas behind the projectile resulting in an increase in the projectile velocity.

3,613,500

COMBINATION PROJECTILE GUIDE AND FIRING CHAMBER SEAL

Francis J. Warin, Oakharbor, Ohio, assignor to TRW Inc., Cleveland, Ohio

Filed Feb. 18, 1969, Ser. No. 800,103
Int. Cl. F41d *11/00*
U.S. Cl. 89—26 **9 Claims**

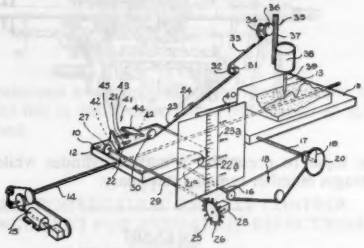


A firing chamber front end seal having two concentric tubular members with out-turned flanges at their leading ends. The flanges are adapted to be seated in a counterbore in the end of the weapon barrel. The inner diameter of the inner member is equal to the diameter of the barrel bore and concentric therewith. The inner member has a substantial wall thickness and strength with an internally frustoconically outwardly tapered end opposite the flanged end. The inner member is effective to act as a projectile guide to align a moving projectile with the weapon barrel. The outer member has a wall thickness less than the inner member and the end remote from the flanged end is adapted to be expanded by pressure of the propellant gases into sealing engagement with the inner diameter of the firing chamber thereby preventing gases from escaping from the chamber at the interface of the chamber and barrel.

3,613,501
METHOD OF AND APPARATUS FOR USE IN PRODUCING A THREE-DIMENSIONAL MODEL OF A PIECE OF TERRAIN

Norman Thomas Sanders, Green Ridges, Mappleborough Green, Studley, England

Filed June 18, 1969, Ser. No. 834,453
Claims priority, application Great Britain, June 18, 1968, 28961/68
Int. Cl. B23c *1/16*
U.S. Cl. 90—13 R 20 Claims

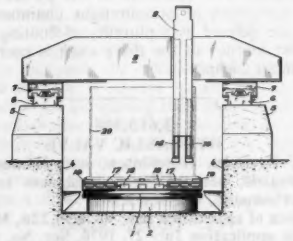


Method of and apparatus for producing a three-dimensional model of a piece of terrain wherein a plan having contour lines, and a block of machineable material, are traversed in unison past a cursor and a motor-driven shaper element respectively, and the height of the shaper element above the block is controlled by moving a control member to bring the appropriate graduation of a height scale displayed in proximity to the plan and cursor into coincidence with a contour line as the latter passes the cursor during traverse, there being an operative connection between the control member and a height adjustment means for the shaping element. Alternatively the ratio of longitudinal traverse increment to height increment may be preset by operation of key switches each corresponding to a particular graduation on a modified stationary scale extending lengthwise of the direction of longitudinal traverse on both sides of a viewing point.

3,613,502
VERTICAL BORING MILL

Hans O. Wagner, Dusseldorf-Lohausen, Germany, assignor to Schiess Aktiengesellschaft, Dusseldorf-Oberkassel, Germany

Filed Mar. 28, 1969, Ser. No. 811,435
Claims priority, application Germany, Mar. 30, 1968, P 17 52 082.0
Int. Cl. B23c *3/04*
U.S. Cl. 90—14 5 Claims

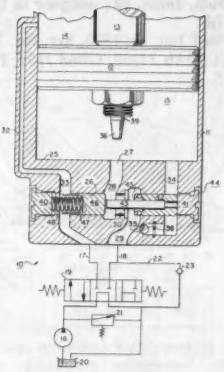


A vertical boring mill, especially for machining large containers, in which the face plate or chuck means is rotatably arranged in a pit while outside said pit and in diametrically opposite arrangement to each other there are provided two guiding bed means each carrying a bed carriage which in their turn support the opposite ends of a transverse beam supporting a vertically displaceable tool carriage, said bed carriages being adapted to displace the transverse beam in the direction of its longitudinal extension, and said guiding bed means being adapted to move said transverse beam in the direction transverse to the longitudinal extension of said transverse beam.

3,613,503
HYDRAULIC CYLINDER WITH PRESSURE CONTROL

John F. Phillips, Hutchinson, Kans., assignor to The Cessna Aircraft Company, Wichita, Kans.

Filed Apr. 28, 1969, Ser. No. 819,655
Int. Cl. F15b *15/22, 13/07*
U.S. Cl. 91—26 10 Claims

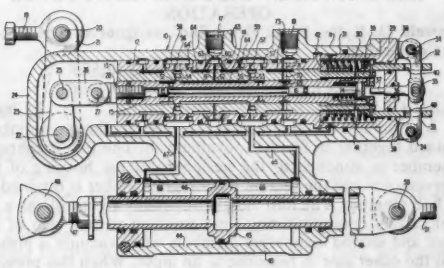


A pressure-actuated control valve which is responsive to an increase in pressure in the contracting or discharge chamber of a hydraulic actuator to restrict discharge flow from said chamber thereby reducing the velocity of the movable barrier therein. The operation of the valve is conditional on inlet pressure as it is held in a nonrestricting position by pressure fluid being admitted to the intake or expanding chamber and moves to a flow-restricting position only when a predetermined loss of pressure occurs in the intake chamber. An additional valve may be included in the system which places the actuator discharge and intake supply passages in communication to shunt fluid therebetween when discharge chamber pressure increases to a predetermined value.

3,613,504
JAMPROOF AND FAIL OPERATIONAL SERVO VALVE FOR AIRCRAFT FLIGHT CONTROL HYDRAULIC SYSTEMS

Hans G. Krauss, Broomall, Pa., assignor to The Boeing Company, Seattle, Wash.

Filed Jan. 19, 1970, Ser. No. 3,703
Int. Cl. F15b *13/04*
U.S. Cl. 91—32 10 Claims



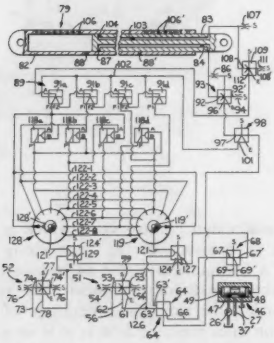
When the primary valve spool in an aircraft flight control servo valve jams or seizes, at any position within its stroke,

the aircraft pilot is enabled not only to halt the resulting run away condition of the affected power ram in the flight control system but is also enabled quite readily to regain full operational control of the aircraft. This regaining of control is made possible through the manual operation of an intermediate auxiliary valve sleeve which will shift with the jammed primary valve spool and the coordinated operation of a primary valve shutoff means which completely nullifies the action of the jammed primary valve spool by closing a return passage for hydraulic fluid.

3,613,505
FLUIDIC MOTION-LIMITING SYSTEM FOR MOTOR-DRIVEN APPARATUS

Thomas J. Bubula, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jan. 19, 1970, Ser. No. 3,734
Int. Cl. F15b *21/02;* **G06d** *1/04;* **F15c** *1/08*
U.S. Cl. 91—35 **10 Claims**



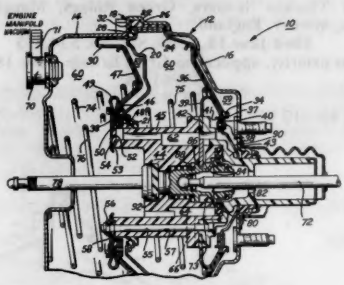
An operator's control lever which is shifted to actuate a hydraulic motor is returned to the initial position to stop the motor after a preselected amount of travel of a element driven by the motor. A fluidic circuit has means producing digital signals indicative of successive increments of travel of the element and has a counter for storing any preselected number of such signals. When the selected count is reached, a kickout means manipulates the operator's control lever to stop further operation of the motor. The count required to stop the motor, and thus the amount of travel of the element, may be changed by turning of a control knob. The system is applicable, for example, to limiting movement of the lift arms of a loader vehicle.

3,613,506
SERVOMOTOR HAVING IMPROVED NO-POWER OPERATION

Oswald O. Kytta, South Bend, Ind., assignor to The Bendix Corporation

Filed July 17, 1969, Ser. No. 842,585
Int. Cl. F15b *9/10, 13/10;* **F01b** *19/00*
U.S. Cl. 91—369 **7 Claims**

A servomotor having first and second diaphragm members joined together to form a movable wall. The first diaphragm member is attached to the periphery of the housing of the servomotor and the second diaphragm member is retained by a hub member. The hub member contains a control valve for selectively communicating fluid pressure to one side of the first and second diaphragm members while vacuum is present on the other side in response to an input. When this pressure differential is sufficient to overcome a resilient force acting on the first diaphragm member, a corresponding force is transmitted to the hub member. If the pressure differential is insufficient to overcome the resilient force, the second diaphragm member will expand as the hub member is moved

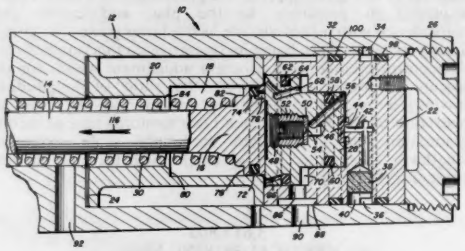


by an input to pressurize a master cylinder while the first diaphragm member remains stationary.

3,613,507
POWERPACK UNIT

Forrest P. Smith, Jr., Northport, N.Y., assignor to United States Surgical Corporation, Baltimore, Md.

Filed Apr. 28, 1970, Ser. No. 32,550
Int. Cl. F15b *13/04;* **F01b** *11/02*
U.S. Cl. 91—398 **10 Claims**



A powerpack for converting gas pressure into rectilinear movement of a drive shaft. The powerpack is activated by unseating a spool, releasing a volume of pressurized gas and thereby driving a shaft adapted to be associated with a mechanism requiring an input of rectilinear movement. Differential pressures cause the spool to be reseated, thus allowing the drive shaft, biased toward the spool, to return to its rest position. The operation of the power unit depends upon the formation of pressuretight chambers; and these chambers are defined by a plurality of floating O-rings. The forwardmost journey of the drive shaft is cushioned by the action of an air dashpot.

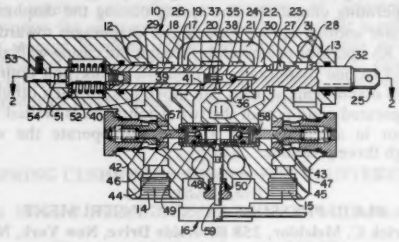
3,613,508
HYDRAULIC VALVE

Robert D. Krehbiel, Hutchinson, and Homer R. Graber, Pretty Prairie, both of Kans., assignors to The Cessna Aircraft Company, Wichita, Kans.

Continuation of application Ser. No. 638,226, May 15, 1967. This application July 27, 1970, Ser. No. 58,333
Int. Cl. F15b *13/042, 11/08*
U.S. Cl. 91—420 **5 Claims**

A manually operated spool type closed center flow control valve having two lockout check valves, one for each end of a double-acting pressure fluid actuated motor. The valve affords precise spool metering of pressure fluid returning from either end of the motor to the hydraulic system reservoir because both lockout check valves are fully opened and maintained open prior to, and entirely independent of, any flow of fluid to or from either end of the motor. Thus

fluid flowing through either of the fully open lockout check valves can in no way interfere with precise spool metering of flow through the control valve. The flow metering spool can



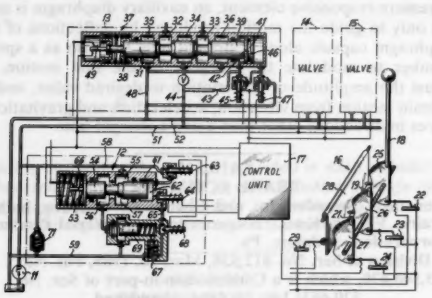
also be positioned to afford floating movement of the motor plunger and rod in either direction in response to an applied external load.

3,613,509

ELECTROHYDRAULIC REMOTE CONTROL ARRANGEMENT FOR HYDRAULIC DIRECTIONAL VALVES

Heinz Flaschar, Ludwigsburg; Wilhelm Weigert, Schwieberdingen; Walter Werner, Waiblingen, and Manfred Kramer, Fellbach-Lindle, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Oct. 30, 1969, Ser. No. 872,671
Claims priority, application Germany, Nov. 6, 1968, P 18 07 173.3
Int. Cl. F15b *13/044*
U.S. Cl. 91—459 **13 Claims**



An arrangement for controlling directional valves electrohydraulically. The valve is connected between a constant pump and a load which is actuated through fluid under pressure from the pump. The directional valve has a control slide to which a signal transducer is secured to give a signal indicative of the position of the control slide. Control levers are also arranged with the control slide and have signal transducers for indicating the deflection of the control lever from a neutral position. A control circuit is connected to the signal transducers for comparing their signal outputs, and to actuate electrohydraulic positioning member on the control slide for controlling the position of the control slide dependent upon the position of the control lever. A switching valve controls the neutral fluid flow from the pump to the load as a function of the position of the control lever.

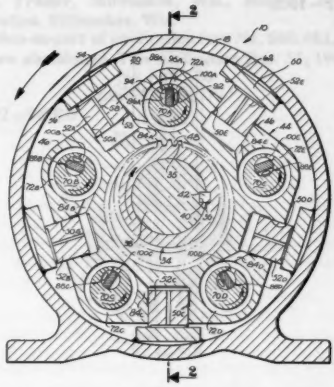
3,613,510

FLUID PRESSURE APPARATUS WITH ORBITING OSCILLATOR

Henry B. Chambers, Santa Barbara, Calif., assignor to Hydranautics, Goleta, Calif.

Filed Apr. 17, 1970, Ser. No. 29,398
Int. Cl. F01b *3/00, 13/04*; **F04b** *1/04*
U.S. Cl. 91—478 **11 Claims**

A low speed, high-torque fluid pressure apparatus adapted for use as a reversable motor or a pump, which includes a rotor having an axis which is fixed relative to the supporting housing and containing external gear teeth which mesh with internal gear teeth on an oscillator mounted for orbital motion relative to the housing. The oscillator contains radially spaced piston cavities which receive reciprocating



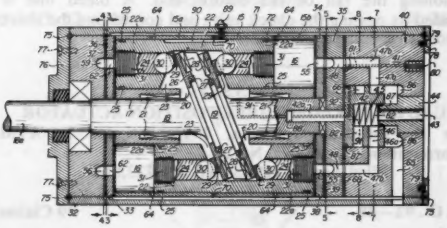
pistons having the outer ends thereof in limited sliding engagement with the housing. Each piston cavity has an eccentric valving assembly associated therewith for controlling the flow of fluid among the piston cavity and the housing fluid inlet and fluid outlet.

3,613,511

FLUID-POWERED, POSITIVE-DISPLACEMENT ENGINE

George D. Eddington, 266 East 100 South, Logan, Utah

Filed Apr. 21, 1969, Ser. No. 818,206
Int. Cl. F01b *3/02, 13/04*
U.S. Cl. 91—502 **11 Claims**

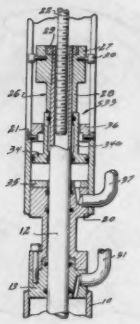


A fluid-powered, positive-displacement engine of the type wherein pistons, in annular series arrangement within respective cylinders, act successively on the circumferential margin of a positionally fixed shuttle plate to rotate a power-output shaft to which the plate is rigidly secured, concentrically therewith. There is disclosed a compact and efficient fluid-flow system for both the supply and exhaust of a pressure fluid, such as steam, that provides the power to operate the engine, and a rotary valve operated by the power-output shaft for timing supply and exhaust of pressure fluid progressively around the annular series of cylinders and for effecting reverse operation of the engine. Each piston is formed to straddle the shuttle plate and to, thus, be double acting at respectively opposite sides of such plate. Adjustable low-friction couplings connect the pistons with the shuttle plate.

3,613,512
PNEUMATIC CONTROL ROD DRIVE INCLUDING A SCRAM CUSHION

William E. Taft, Los Gatos, Calif., assignor to The United States of America as represented by the United States Atomic Energy Commission

Filed Oct. 16, 1969, Ser. No. 866,928
Int. Cl. F01b *31/00*
U.S. Cl. 92—13.8 2 Claims

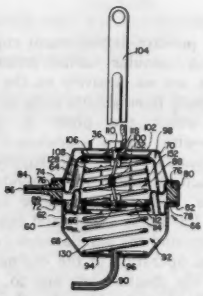


A control rod drive for a nuclear reactor includes a vertically disposed pneumatic cylinder containing a piston having shafts extending above and below the piston. The lower shaft is connected to the control rod and the upper shaft extends through a second, short pneumatic cylinder to terminate in an enlarged head. Air is supplied to the pneumatic cylinder below the piston during normal operation of the reactor to force the enlarged head of the upper shaft against a stop nut on a lead screw, the position of the stop nut on the lead screw determining the position of the control rod within the reactor. To scram the reactor high-pressure air is admitted to the pneumatic cylinder above the piston while the air below the piston is simultaneously exhausted. Deceleration of the control rod is obtained by admitting the high-pressure air used for scramming the reactor through a check valve into the second, short pneumatic cylinder below a free-floating piston therein. When the upper shaft head contacts the piston air is compressed in the second cylinder cushioning the fall of the control rod. A bleed line is provided by passing the check valve and connecting the short cylinder to the scram gasline.

3,613,513
DUAL DIAPHRAGM THREE-POSITION ACTUATOR

Jesse R. Johnson, Gowanda, N.Y., assignor to AVM Corporation, Jamestown, N.Y.

Filed Apr. 24, 1968, Ser. No. 723,862
Int. Cl. F01b *19/00*
U.S. Cl. 92—48 39 Claims

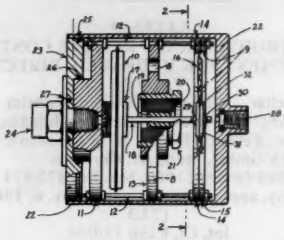


A three-position vacuum actuator having a housing including two diaphragms clamped between parts of the housing and a fluid communicating spacer ring located between the outer edges of the diaphragms. Fluid communication passages lead into all three chambers formed by the casing and the two diaphragms. Springs are in each of two operating chambers, one spring biasing the diaphragms apart and another spring biasing one diaphragm toward the other. An operator rod extends through the casing wall and is secured to one diaphragm. A collapsible link unit connects the two diaphragms so they can move toward each other yet the separated condition of the two diaphragms is limited. The actuator in assembly with a valve will operate the valve through three positions.

3,613,514
FLUID PRESSURE SENSING INSTRUMENT

Frederick C. Melchior, 258 Riverside Drive, New York, N.Y.

Filed Apr. 24, 1969, Ser. No. 819,007
Int. Cl. G01l *9/10*; F01b *19/02*
U.S. Cl. 92—48 1 Claim

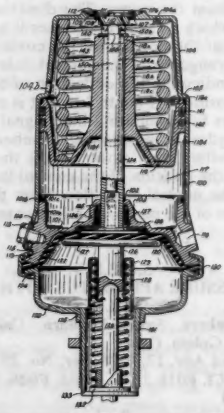


In a fluid pressure sensing instrument using a diaphragm as a pressure-responsive element, an auxiliary diaphragm is used not only to guide the motion produced by deflections of the diaphragm capsule along a straight line, but also as a spring member to modulate the linearity of the said motion, to adjust the amplitude of said motion to desired value, and to restrain motion from vibration, acceleration and gravitational forces in directions other than along a straight line.

3,613,515
BRAKE ACTUATOR

Kenneth D. Swander, Jr., and Charles G. Wearden, both of Prairie Village, Kans., assignors to Certain-Teed Products Corporation, Ardmore, Pa.

Division of Ser. No. 812,538, Mar. 10, 1969, Pat. No. 3,508,470, which is a Continuation-in-part of Ser. No. 520,693, Jan. 14, 1966, abandoned.
Filed Sept. 22, 1969, Ser. No. 859,782
Int. Cl. F01b *21/02*
U.S. Cl. 92—63 4 Claims



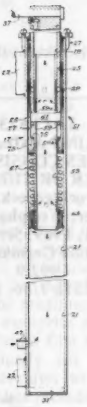
A vehicle spring emergency and parking brake of the "add-on" or "piggy back" type with the spring chamber

outboard (with respect to the wheel, axle or brake, per se) of the service (diaphragm) chamber, said add-on brake having a mechanical release (manual spring back-off) utilizing a bolt stored within the spring chamber itself, one modification having means preventing or warning of attempts to recompress the emergency spring before the bolt is restored to its storage position within the spring chamber and one modification having a portion of the spring chamber retractable within the spring chamber housing itself when the emergency or power spring has been expanded.

3,613,516
SPRING CUSHIONING DEVICE FOR CLUSTERED CYLINDER LIFTS

Frank Howard Field, 133 East Virginia Blvd., Jamestown, N.Y.

Filed Aug. 28, 1969, Ser. No. 853,854
Int. Cl. F01b *11/02*
U.S. Cl. 92—85 **6 Claims**

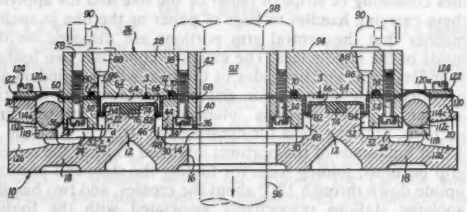


Spring cushioning devices are provided in each cylinder of a clustered cylinder lift, each device including a single coil-type compression spring operable to cushion its associated cylinder during both extension and retraction thereof.

3,613,517
TENSION LOAD CELL

Chester D. Bradley, Darien, and Malcolm C. Tate, Stamford, both of Conn., assignors to The A. H. Emery Company, New Canaan, Conn.

Filed Mar. 18, 1970, Ser. No. 20,747
Int. Cl. F16j *3/00*
U.S. Cl. 92—98 **5 Claims**

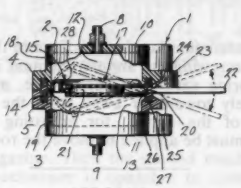


A piston-cylinder type load cell for the measurement of tension loads. The piston and cooperating cylinder portions are ring-shaped and surround an open central passage through the cell which accommodates a simple, external tension loading member. The piston and cylinder carrying members may be assembled about roller bearings for free relative axial and angular telescopic movement even under high-cross loads. The cell may also be provided with a flexible diaphragm which extends over the roller bearings and is secured to form an integral dust jacket.

3,613,518
DIAPHRAGM ACTUATOR

David G. Prosser, Milwaukee, Wis., assignor to Autorol Corporation, Milwaukee, Wis.

Continuation-in-part of application Ser. No. 800,481, Feb. 19, 1969, now abandoned. This application Dec. 31, 1969, Ser. No. 889,670
Int. Cl. F16j *3/00*
U.S. Cl. 92—98 RD **3 Claims**

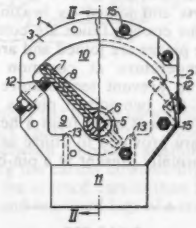


A diaphragm actuator includes a rigid lever that has an internal arm embedded in a soft resilient rubber membrane to reciprocate pivotally between two chambers in a housing and an external arm which projects out of the housing to reciprocate pivotally externally of the housing. Two hollow members clamped together against a seal formed about the periphery of the membrane make up the housing. The seal also serves as a fulcrum where the lever projects out of the housing. Either end of the lever may serve as a force end or a work end.

3,613,519
PRESSURE FLUID OPERATED ACTUATORS

John N. Southall, Dudley, England, assignor to Serck Industries Limited, Birmingham, England

Filed Feb. 17, 1969, Ser. No. 799,627
Claims priority, application Great Britain, Feb. 22, 1968, 8635/68
Int. Cl. F01c *9/00*
U.S. Cl. 92—125 **4 Claims**



A pressure fluid rotary vane actuator in which the actuator housing is formed of thermosetting resin and the rotary vane is encapsulated in an integrally molded rubber covering.

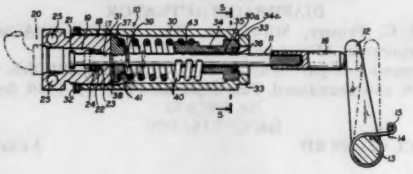
3,613,520
THROTTLE CONTROL VALVE ASSEMBLY

Donald A. Worden, Pompton Plains, N.J., assignor to Morotta Scientific Controls, Inc., Boonton, N.J.

Filed Apr. 27, 1970, Ser. No. 32,317
Int. Cl. F01b *31/00*
U.S. Cl. 92—133 **6 Claims**

This is mechanism for adjusting the pressure to be applied to actuate valve that is operate by movement of a rod. The rod is slidably received through a bore through a base

member and extends through a sleeve that has one end threaded onto the base member. A coil spring around the portion of the rod within the sleeve has one end attached to a collar that is on the rod in a fixed position relative to the length of the rod and its other end loosely threaded onto a



matingly threaded annular element fixed in the interior of the sleeve. Thus, screwing the annular element relatively into or out of the spring varies the spring rate, and screwing the sleeve relatively toward or away from the base varies the compression of the spring, for adjusting the amount of pressure that must be applied to move the rod.

3,613,521

PISTON FOR INTERNAL COMBUSTION ENGINE

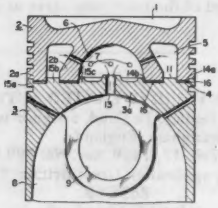
Takumi Itano, Tokyo, Japan, assignor to Komatsu Manufacturing Co., Ltd., Tokyo, Japan

Filed Sept. 30, 1969, Ser. No. 862,422

Claims priority, application Japan, Nov. 7, 1968, 43/80921

Int. Cl. F01b *31/08;* F16j *1/00;* B23p *15/10*

U.S. Cl. 92—186 **4 Claims**



This specification discloses a cooling system for a piston formed of two parts and joined by brazing within annular grooves. Passages for cooling fluids are conveniently formed before the separate pieces are joined and are positioned such that the high temperature at common joined areas is effectively limited to prevent temperature deterioration of the bond between the two joined pieces. In addition, the cooling fluid transfers heat away from a head portion of the piston and means are provided to utilize as a cooling fluid a lubricating fluid normally present at a pin-bearing surface of the piston.

3,613,522

METHOD OF PRODUCING CUSHIONING DUNNAGE

George R. Johnson, Chagrin Falls, Ohio, assignor to The Arpax Company, Chagrin Falls, Ohio

Division of Ser. No. 640,145, May 22, 1967, abandoned.

Filed Sept. 12, 1969, Ser. No. 857,307

Int. Cl. B31f *1/10;* B31d *5/00;* B31b *49/00*

U.S. Cl. 93—1 WZ **14 Claims**

A method of producing coiled, resilient cushioning dunnage comprising taking a web of sheetlike material, such as paper, of predetermined width and crumpling it down into a relatively narrow strip and then forming the strip by pressure into generally helically coiled form. Also a method of producing elongated, tubularlike dunnage is disclosed which comprises taking a web of flexible sheetlike material, such as paper, of predetermined width and forming the web into a generally tubularlike shape by moving the lengthwise edges of the web inwardly toward one another and then loosely crumpling the inwardly turned web and stitching the

article along the lengthwise extent thereof to maintain it in its formed configuration.

3,613,523

MACHINE FOR MAKING AND APPLYING U-SHAPED CARRYING HANDLES CONSISTING OF STRIPS OF PAPER OR THE LIKE

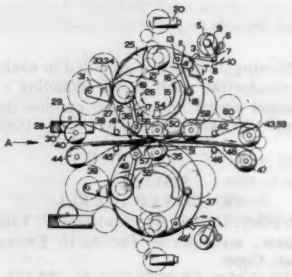
Heinz Wesselmann, Brochterbeck, Germany, assignor to Windmoller & Holscher, Westphalia, Germany

Filed July 31, 1969, Ser. No. 846,453

Claims priority, application Germany, Aug. 2, 1968, P 17 61 992.0

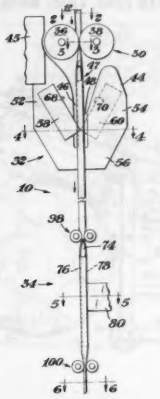
Int. Cl. B31b *1/86;* B31d *1/06*

U.S. Cl. 93—8 WA **16 Claims**



A machine is provided for making U-shaped carrying handles consisting of strips of paper or the like and for applying these carrying handles to bags of paper or the like in such a manner that the central grip portions are disposed on the inside of the handle legs. The machine comprises two folding cylinders for respective sides of the bag, which cylinders are provided with grippers for gripping the strips of material adjacent to the portions intended to form central grip portions, creasing tools for creasing the strips at an angle of 45° at both ends of the portions intended to form the central grip portions, folding tools for folding the strip end portions upside down through 180° about the creases, and two handle-applying stations respectively associated with the folding cylinders. The tools of the creasing station are arranged to produce creases on the outside relative to the periphery of the folding cylinder. The width of the folding cylinder in the area where the handle legs are formed is smaller than the clear width between the creasing tools. The folding tools are caused to act from the outside on the strip end portions, which are folded inwardly relative to the periphery of the folding cylinder.

3,613,524
METHOD AND APPARATUS FOR MANUFACTURING BAG STOCK
Raymond D. Behr, Midland; Edward A. Friebe, Kawkawlin, and Earl E. Brandow, Bay City, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.
Filed Feb. 24, 1970, Ser. No. 13,487
Int. Cl. B31b *1/18;* B37b *1/60;* B31b *1/78*
U.S. Cl. 93—33 R 19 Claims



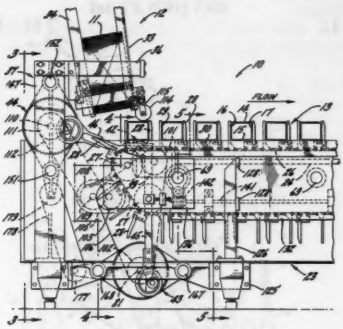
Method and apparatus for fitting together multiple pairs of interlocking beadlike closure members of a type extending continuously at the inside of tubular film while the film is moving such as during its manufacture, and at a rate accommodating at least the maximum extrusion speed of the film. Such apparatus can comprise a forward slitting station adapted to receive the tubular film in a flattened condition, separate it, and strategically slit the same for use as bagmaking stock; and thereafter to controllably direct the film to a mandrellike member including guide means such as, for example, grooves or the like. The latter align the pairs of closure members, respectively, to cooperatively assist subsequent fitting of the pairs together such as by application of external pressure. Such method and apparatus effectively overcomes problems relating to irregularities in the lateral spacing between the closure pairs.

ERRATUM

For Class 93—35R see:
Patent No. 3,613,288

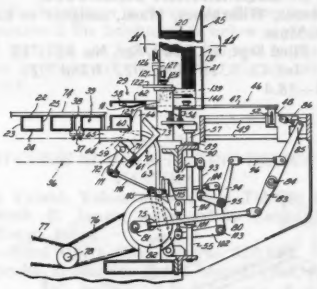
3,613,525
CARTON-HANDLING DEVICE
Robert F. Lense, and Wilbur M. Court, both of Rockford, Ill., assignors to Riegel Paper Corporation, New York, N.Y.
Filed Jan. 27, 1970, Ser. No. 6,240
Int. Cl. B31b *1/76*
U.S. Cl. 93—53 SD 11 Claims

A device for drawing successive flattened cartons downwardly and outwardly from a magazine and placing each carton on a conveyor between two successive, spaced holders on the conveyor in timed relation with the speed at which the holders are moved. As an incident to being drawn from the magazine, each carton is erected and thus is placed on the conveyor in an erected position to be filled with a product. A transfer device for gripping the cartons and delivering the latter from the magazine to the conveyor is moved along a triangular path by the action of two drive mechanisms acting in concert. One drive mechanism is operative to raise and lower the transfer device, and the second is operative to move the transfer device horizontally. To draw the carton out of the magazine and place it on the conveyor, both mechanisms work together thus moving the transfer device downwardly and outwardly toward the conveyor along one leg of the triangle. A dwell means is built into each drive mechanism so that, after the carton is placed on the conveyor, the first mechanism dwells and the second mechanism moves the transfer device in a generally horizontal direction from the conveyor to a position spaced



beneath the magazine. Then the second mechanism dwells, and the first mechanism is operable to raise the transfer device into engagement with the terminal carton in the magazine.

3,613,526
CARTON FEEDING AND ERICTING APPARATUS
Wickliffe Jones, Cincinnati, Ohio, assignor to R. A. Jones and Company, Inc., Covington, Ky.
Filed May 9, 1969, Ser. No. 823,430
Int. Cl. B31b *1/76*
U.S. Cl. 93—53 R 9 Claims

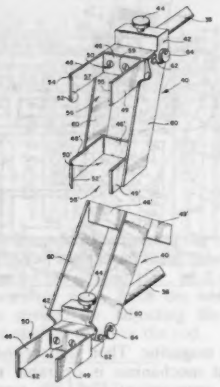


Apparatus whereby flat folded carton blanks are fed one at a time from a stack contained within a magazine, each blank being gripped between opposed suction cups, the lower suction cup pulling the carton downwardly against a guide to open or erect it, the erected carton then being carried away between forward and rearward lugs of a transport conveyor.

3,613,527
CONTAINER ERECTING AND HOLDING DEVICE
Ronald L. Hentges, Minneapolis, and Howard R. Garrett, St. Paul, both of Minn., assignors to Haskon Incorporated, Warsaw, Ind.
Filed Aug. 15, 1969, Ser. No. 850,527
Int. Cl. B31b *1/78;* B23q *3/10;* B25j *15/00*
U.S. Cl. 93—53 R 5 Claims

A device is provided for erecting and holding a flattened tubular container blank of generally rectangular cross section in an open and upright position, from its external vertical sides, for use in a container forming, filling, and sealing machine. The device includes a backing plate for engaging the outer surface of a first wall of the container blank, a pair of side flanges that extend normally outward from the

backing plate for engaging the outer surface of the pair of opposed container walls adjacent the first wall, and a locking lip that extends inwardly from the outer end of one of the



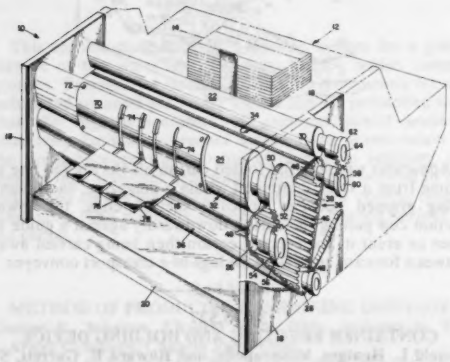
side flanges for engaging the outer surface of the container wall opposite the first wall to keep the container blank in an open position against its inherent resiliency to return to flattened form.

3,613,528

BELT ROTARY DIECUTTER

Roy E. Vermes, Wilbraham, Mass., assignor to Revco, Inc., Agawam, Mass.

Filed Sept. 15, 1969, Ser. No. 857,712
Int. Cl. B31b *1/06, 1/22;* **B26d** *7/20*
U.S. Cl. 93—58.4 **1 Claim**



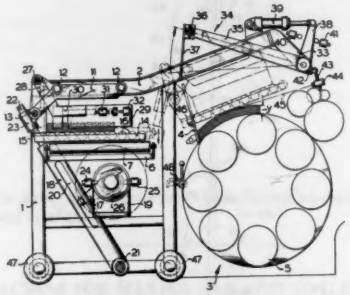
Diecutting apparatus for cutting and slotting corrugated carton blanks comprising, a rotatable die-mounting roll carrying a plurality of cutting dies on its periphery, a backup roll defining, with the die-mounting roll, a nip, a resilient endless belt passing through the nip and entrained around the backup roll, and feed means for feeding a carton blank into the nip for the cutting and slotting thereof by the cutting die.

3,613,529

APPARATUS FOR AUTOMATICALLY CHARGING A STACK MAGAZINE OF A BAG-MAKING MACHINE WITH TUBE SECTION STACKS

Willi Stork, Tecklenburg, and Karl Haupt, Wolbeck via Munster, both of Germany, assignors to Windmoller & Holscher, Lengerich of Westphalia, Germany, by said Haupt

Filed Feb. 24, 1970, Ser. No. 13,351
Claims priority, application Germany, Feb. 27, 1969, P 19 10 059.5
Int. Cl. B31b *1/98, 1/08;* **B65b** *67/00*
U.S. Cl. 93—93 HT **13 Claims**



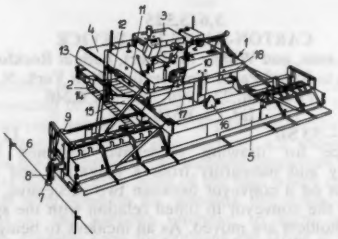
A roller bed serves to receive the tube section stacks from a feeder conveyor. A movable transfer rake has tine rods which are about as long as the rollers of the roller bed and in one end position extend between the rollers of the roller bed. The rake is movable relative to the roller bed in a vertical direction to take over the stacks and subsequently in a substantially horizontal direction to its other end position. A stripper is movable to a position behind the stack of tube sections lying on the transfer rake above the stack magazine and remains in stripping position during the return movement of the transfer rake.

3,613,530

APPARATUS FOR POSITIONING A FINISHING SCREED MEMBER IN A ROAD PAVING MACHINE

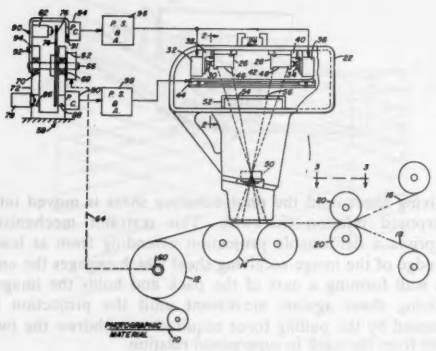
Bruno Hess, Ladenburg, Germany, assignor to Joseph Vogele AG, Mannheim, Germany

Filed Sept. 9, 1969, Ser. No. 856,332
Claims priority, application Germany, Sept. 17, 1968, P 17 84 775.5
Int. Cl. E01c *19/48*
U.S. Cl. 94—46 AC **5 Claims**



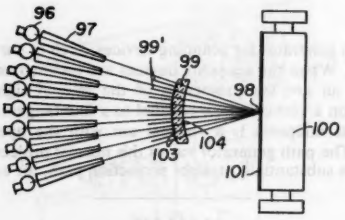
In a road-paving machine, surfacing material is deposited on a subbase and a finishing screed board spreads and finishes or levels the surface of the material to the proper grade and plane. Test feelers are mounted on the screed board to detect any deflections from a reference position, though the machine causes vibration, the test feelers are arranged to measure the actual deflection and to signal the extent of the deflection to a regulating instrument for correcting the position of the screed board in accordance with the deflections measured.

3,613,531
MANUFACTURING PHOTOGRAPHIC WEBS
Raymond Lorenzini, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Oct. 15, 1969, Ser. No. 866,680
Int. Cl. G03b 17/24
U.S. Cl. 95—1.1 3 Claims



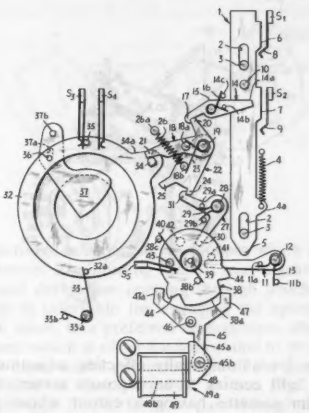
A photographic web is manufactured with latent images of reference indicia along the length of such web. A projection printer embodies a mechanical counter which is driven by means of a stepping motor; and a flash tube is adapted to be excited after such discrete counter indexing (and before a subsequent indexing thereof) to image the counter face onto the web. A controller not only assures that the indicia is evenly disposed along the length of the web, but assures that flashing sees only stationary counts.

3,613,532
RAY TYPEWRITER
Ernest Wildhaber, 124 Summit Drive, Rochester, N.Y.
Filed May 1, 1969, Ser. No. 820,958
Int. Cl. B41b 13/00, 15/00, 17/00
U.S. Cl. 95—4.5 R 18 Claims



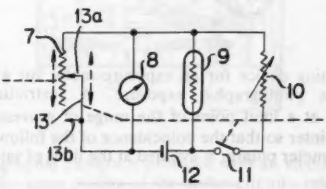
This ray typewriter has two main applications. It may serve as a computer output to rapidly produce small-size photographic copies, or also as a typewriter operated by hand from a keyboard. Each type has its own source of radiant energy that is directed through an outlet representing the type. Said sources are arranged in an arc about a common point and their rays are directed towards said point. When activated, images of said outlets are made in a common region containing said point. In a computer output said successive images are reduced in size and placed along lines on a record. In a manually operated typewriter they are directly printed on the record.

3,613,533
AUTOMATIC FLASHING DEVICE
Kiyoshi Kitai, Tokyo, Japan, assignor to Kabushiki Kaisha Hattori Tokeiten, Tokyo, Japan
Filed Feb. 25, 1969, Ser. No. 801,988
Claims priority, application Japan, Feb. 28, 1968, 43/12430
Int. Cl. G01j 1/00
U.S. Cl. 95—10 C 11 Claims



A camera is equipped with apparatus including an electric circuit for sensing the brightness of a subject to be photographed and means for automatically taking a daylight exposure if the brightness is above a predetermined level and a flash exposure if the brightness is below a predetermined level. Also included are lights that indicate to the operator that certain portions of the electric circuit are in their operative state.

3,613,534
FLASH GUIDE NUMBER SETTING DEVICE FOR CAMERA
Mutsunobu Yazaki, Yokohama-shi, and Takashi Uchiyama, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed May 1, 1969, Ser. No. 820,901
Claims priority, application Japan, May 9, 1968, 43/38016
Int. Cl. G03b 7/16
U.S. Cl. 95—10 C 4 Claims

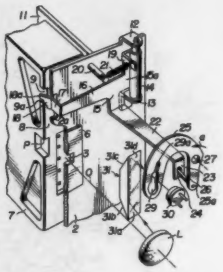


A guide number setting device wherein a guide number for a predetermined film sensitivity may be set by a guide number setting ring irrespective of the sensitivity of the film being used when flash photography is made by utilizing an exposure control mechanism of a camera having a built-in exposure meter.

3,613,535
DEVICE FOR AUTOMATICALLY EFFECTING ADJUSTMENTS OF THE VOLUME OF LIGHT COMING TO AN EXPOSURE METER OF A CAMERA

Yoshiaki Hirabayashi, Nagano-ken, Japan, assignor to Sankyo Kogaku Kogyo Kabushiki-Kaisha, Oaza, Suwa-shi, Nagano-ken, Japan

Filed July 18, 1969, Ser. No. 842,871
Claims priority, application Japan, July 29, 1968, 43/53008
Int. Cl. G03b *19/04, 19/18*
U.S. Cl. 95—10 C **5 Claims**

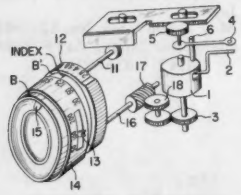


A device for automatically effecting adjustments of the volume of light coming to an exposure meter of a camera using a film cassette having a cutout whose position is determined by the sensitivity of a particular film contained in said film cassette. When such film cassette is inserted in a film cassette housing of the camera, the angle of pivotal motion of a bifurcated member of the camera is determined by the position of said cutout, whereby adjustments of the volume of light incident on the exposure meter can be automatically effected.

3,613,536
WARNING DEVICE FOR EXPOSURE METER

Tatsuya Taguchi, Tokyo, and Yoshiaki Watanabe, Fujisawa-shi, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed July 18, 1969, Ser. No. 843,056
Claims priority, application Japan, July 24, 1968, 43/63274
Int. Cl. G03b *7/04, 17/18*
U.S. Cl. 95—10 C **2 Claims**



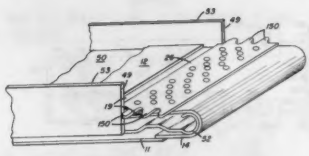
A warning device for an exposure meter for avoiding an erroneous photographic exposure. A restricting pin is provided at a limit point of the range of movement of the meter pointer so that the coincidence of the followup pointer with the meter pointer is avoided at the limit of said range.

3,613,537
PHOTOGRAPHIC FILM PACK

David A. Frost, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed July 15, 1969, Ser. No. 841,864
Int. Cl. G03b *17/50*
U.S. Cl. 95—13 **12 Claims**

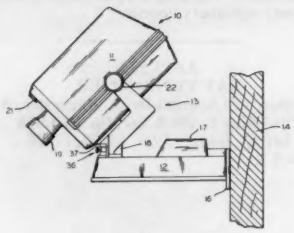
A film pack containing a plurality of film units in which a diffusion transfer process is utilized to form photographic images and each film unit comprises a photosensitive sheet which is connected to an image-receiving sheet by means for moving the photosensitive sheet, after exposure, into superposition with the image-receiving sheet and thereafter withdrawing the two sheets in superposed relation through an opening in the end of the pack to spread a processing liquid between the two sheets is provided with an improved restraint mechanism for restraining movement of the image-receiving sheet until the photosensitive sheet is moved into superposed relation therewith. This restraint mechanism comprises a deformable projection extending from at least one edge of the image-receiving sheet which engages the end of a wall forming a part of the pack and holds the image-receiving sheet against movement until the projection is deformed by the pulling force required to withdraw the two sheets from the pack in superposed relation.



3,613,538
CAMERA PATH GENERATOR

Charles Horberg, Jr., Chicago, Ill., assignor to Norman Industries, Inc., Chicago, Ill.

Filed Dec. 2, 1968, Ser. No. 780,544
Int. Cl. G03b *37/00*
U.S. Cl. 95—15 **9 Claims**



A path generator for scanning devices, such as surveillance cameras. When the scanning devices are inclined and sweep through an arc the projection of the line of sight of the camera on a vertical plane parallel to a line tangential to the arc at its midpoint is a vertical arc with the apex at the center. The path generator varies this normal projection path to form a substantially straight projection path, for example.

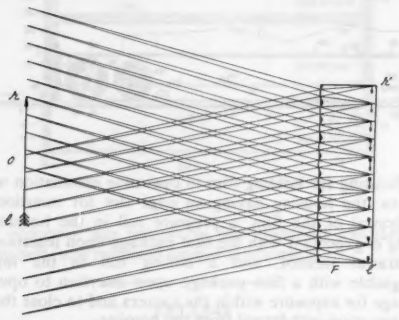
3,613,539
INTEGRAL PHOTOGRAPHY

Leslie Peter Dudley, 10354 Wilshire Blvd. Apt. 1, Los Angeles, Calif.

Filed July 26, 1968, Ser. No. 747,996
Int. Cl. G03b *35/08*
U.S. Cl. 95—18 **3 Claims**

Photographs of the integral type, exhibiting the effect of parallax about both horizontal and vertical axes, are recorded on a spherically lenticulated film or a spherically lenticulated screen-film combination by means of a modified type of camera. Light is admitted to the film via a rectangular aperture in the front of the camera instead of via the usual photographic objective. If the camera is held stationary during an exposure, the resulting photograph is pseudoscopic instead of stereoscopic. A feature of the invention is a

method, comprising a sequential printing technique, by which the elementary images constituting the composite picture are so transposed that the reproduction is stereoscopic. Another feature of the invention involves lateral movement of the camera during an exposure so that



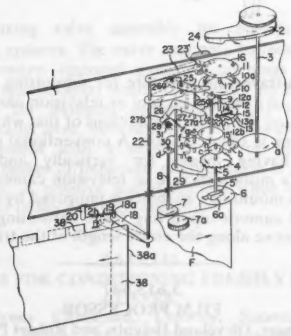
the necessary transposition is accomplished within the camera. Further features of the invention reside in methods of increasing the effective stereoscopic base of the integral photographic system and methods of adapting the system to aerial photography.

3,613,540

FILM COUNTER CHANGEOVER DEVICE FOR DIFFERENT KINDS OF FILM HAVING DIFFERENT FRAMES

Makoto Nakamura, Urawa-shi, Japan, assignor to Nippon Kogaku K. K., Tokyo, Japan

Filed Oct. 7, 1969, Ser. No. 864,500
Claims priority, application Japan, Oct. 14, 1968, 43/89545
Int. Cl. G03b *1/14, 1/62, 1/66*
U.S. Cl. 95—31 DS **4 Claims**



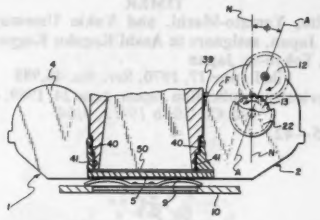
A frame counter changeover and film-metering device is interconnected with a film guide changeover device to enable a camera to operate with different lengths and thickness of film. The film guide changeover device consists of two slidable pressure plates. Upon operation of an external control, the gap between the two plates is varied to accommodate different film thicknesses. The external control also adjusts the frame counter to accommodate different lengths of film.

3,613,541

GEAR DRIVE FOR A CAMERA AND FILM CARTRIDGE

David E. Beach, Penfield, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 6, 1970, Ser. No. 26,015
Int. Cl. G03b *19/04*
U.S. Cl. 95—31 R **3 Claims**



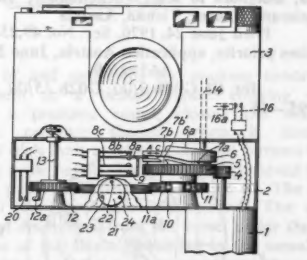
A film cartridge housing encloses a core which is rotatably mounted therein. The housing extends over a gear carried by the spool and defines an opening through which a camera driving gear is insertable for engaging the spool gear and rotating the spool. In a preferred embodiment, the gear axes define a plane which is offset from a normal to the film plane by an angle equal to the pressure angle of the gears, thereby creating a line of force parallel to the film plane. By arranging for such line of force to pass through a cartridge-supporting surface in the camera at a position where the film cartridge contacts the surface, any tendency of the cartridge to be unseated from the supporting surface in response to the creation of a force component normal to the film plane is negated.

3,613,542

PHOTOGRAPHIC CAMERA HAVING ELECTRIC MOTOR DRIVE

Willi Wiessner, Wetzlar, and Georg Mann, Staufenberg, both of Germany, assignors to Ernst Leitz GmbH, Wetzlar, Germany

Filed June 29, 1970, Ser. No. 50,805
Claims priority, application Germany, July 8, 1968, P 19 34 466.2
Int. Cl. G03b *19/04, 17/36*
U.S. Cl. 95—31 EL **8 Claims**



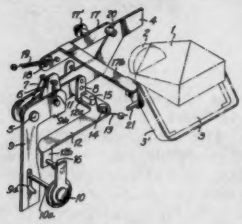
A photographic camera is provided with an electric motor drive which—upon closing of the motor circuit—releases the camera shutter in a first phase of operation, is then brought to a standstill for the time of the shutter run, and is started at the end of the shutter run by the shutter itself into a second phase of operation wherein the motor drive completes the shutter-cocking and film-advancing action. An electric contact is arranged in the proximity of an element that is rotated once per shutter-cocking and film-advancing action and the element is provided with a wiper that closes the contact momentarily once during every rotation. An electric pulse is thus generated during every film-advancing action and is made available at the outside wall of the motor drive

housing. The pulse may be put to different uses, for example, to release a second camera of similar type, the pulse of which is fed back for releasing the first camera so that both cameras release one another, or to operate an electromagnetic remote picture-counting device.

3,613,543
VIEWFINDER SHIELD FOR A CAMERA WITH A SELF-TIMER

Kunio Mita, Yamato-Machi, and Yukio Umemura, Tokyo, both of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo-to, Japan

Filed June 17, 1970, Ser. No. 46,988
Claims priority, application Japan, June 24, 1969, 44/49304
Int. Cl. G03b *19/12, 9/64*
U.S. Cl. 95—42 **10 Claims**

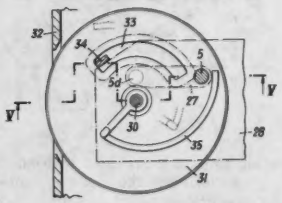


A camera having the possibility of shielding the viewfinder. The viewfinder of the camera provides a predetermined path for the viewfinder light. A shielding element is movable from a nonshielding position to a shielding position extending across the latter path to interrupt the travel of viewfinder light. When a self-timer of the camera is set for operation the shielding component is capable of moving to its shielding position. However, a releasable holding device holds the shielding component in its nonshielding position until operation of the self-timer is actually started. It is only in response to starting of the operation of the self-timer that the shielding component is released for movement to its shielding position.

3,613,544
OPTICAL SYSTEM

Hanns Plihal; Gerhard Rothy, and Josef Schild, all of Vienna, Austria, assignors to Karl Vockenhuber, Vienna, Austria and Raimund Hauser, Vienna, Austria

Filed June 24, 1970, Ser. No. 49,233
Claims priority, application Austria, June 27, 1969, A6194/69
Int. Cl. G03b *3/00;* **G02b** *15/00*
U.S. Cl. 95—45 **32 Claims**

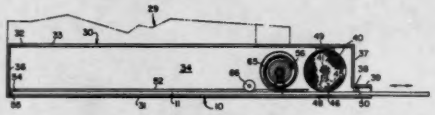


A focusing arrangement for a lens system. Two mutually independent focusing mechanisms, one of which is associated with a normal range and the other a macrophotographic range are cooperatively connected to an adjusting device for at least one optical element. The optical system has substantially different optical responses to the operation of the normal and macrophotographic range focusing mechanisms.

3,613,545
FILM-HOLDING CAMERA CONSTRUCTION AND FILM PACKAGE

Mark J. Cohn, 123 South Berkley Square, Atlantic City, N.J.

Filed Jan. 3, 1969, Ser. No. 788,731
Int. Cl. G03b *17/26*
U.S. Cl. 95—66 **4 Claims**

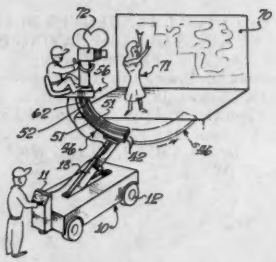


A housing for holding film in operative association with a camera, the housing having an edge slot for insertion and withdrawal of the film, a pressure roll in the housing for rolling engagement with the film package upon insertion and withdrawal thereof, and a coiling roll in the housing engageable with a film package upon insertion to open the package for exposure within the camera and to close the film package upon withdrawal from the housing.

3,613,546
CAMERA-TRAVERSING STRUCTURE

Donald M. Richardson, 1751 Old Ranch Road, Los Angeles, Calif.

Filed Sept. 8, 1969, Ser. No. 855,826
Int. Cl. G03b *17/56*
U.S. Cl. 95—86 **4 Claims**



A camera-traversing structure for supporting and altering the position of a motion picture or television camera without dependence on the surface conditions of that which a camera dolly or crane is situated upon. A conventional camera dolly or crane having means for vertically and/or radially positioning a motion picture or television camera is utilized. The camera-mounting capability is improved by the inclusion of a curved camera-supporting track permitting the camera to slidably move along the entire length of the track.

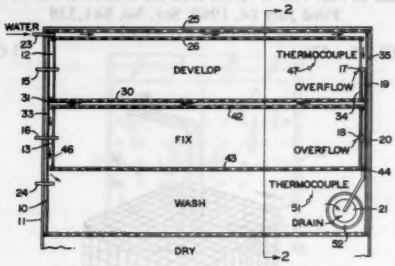
3,613,547
FILM PROCESSOR

James L. Snarr, Cleveland Heights, and Robert P. Hunt, South Euclid, both of Ohio, assignors to Picker Corporation, White Plains, N.Y.

Filed Jan. 23, 1969, Ser. No. 793,478
Int. Cl. G03d *3/02*
U.S. Cl. 95—96 **8 Claims**

An X-ray film processing machine having a main tank for retaining wash water. Developer and fixer tanks are positioned in spaced relationship in the main tank. Water is circulated around the developer tank to maintain the temperature of the developer at a desired level. The temperature of the developer is sensed to control the temperature of water being added to the main tank. Other

water is added to the wash tank as required to maintain wash water at its desired temperature.



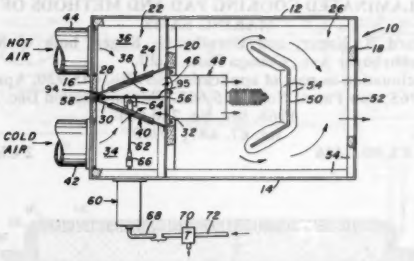
The processor has removable film transport mechanisms utilizing belts and rollers in spaced relationship.

3,613,548

AIR-MIXING VALVE ASSEMBLY

Paul V. Motts, and Wayne K. Stoops, both of Connersville, Ind., assignors to H. H. Robertson Company, Pittsburgh, Pa.

Filed Dec. 30, 1968, Ser. No. 787,935
Int. Cl. F24f 13/04
U.S. Cl. 98—38 **12 Claims**



An air-mixing valve assembly for high-pressure air-conditioning systems. The valve assembly includes a damper disposed between opposed gasketed openings which are provided in spaced-apart walls. Link hinge means supports the damper for swinging movement about two spaced generally parallel axes, between the walls, toward and away from engagement with a selected one of the gasketed openings. A gasket of improved configuration is provided at each opening. A positive seal is formed when the damper engages either of the gasketed openings.

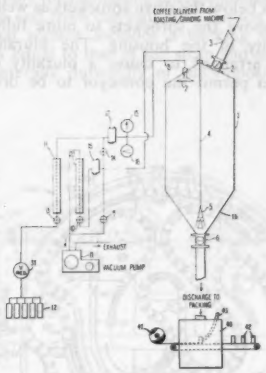
3,613,549

APPARATUS FOR CONDITIONING FRESHLY ROASTED COFFEE

Ronald Cheyney Champion, Crawley, Sussex, England, assignor to Kenco Coffee Company, Limited, London, England

Division of Ser. No. 767,443, Oct. 14, 1968, Pat. No. 3,506,446.
Filed Feb. 11, 1970, Ser. No. 14,889
Claims priority, application Great Britain, Oct. 16, 1967 47058/67
Int. Cl. A23f 1/02
U.S. Cl. 99—236 **4 Claims**

A process and apparatus for conditioning freshly roasted coffee to remove CO_2 therefrom. To accelerate evolution of the CO_2 from the cells of the coffee, the coffee is confined in a space evacuated to a subatmospheric pressure level, but a pressure level which is in a range above the vapor pressures of at least the majority of the volatile constituents of the coffee, the coffee being maintained in said space until



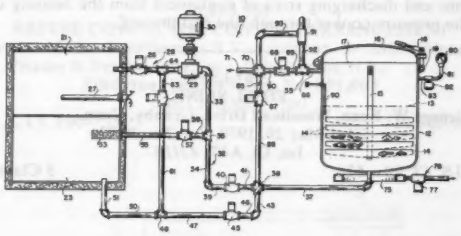
sufficient CO_2 has evolved from the coffee cells to allow final packaging of the coffee in sealed containers.

3,613,550

APPARATUS FOR COOKING FOODSTUFFS

Neal W. Thompson, Monroeville, Pa., assignor to Small Business Administration

Continuation-in-part of application Ser. No. 665,478, Sept. 5, 1967, now abandoned. This application July 1, 1968, Ser. No. 747,760
Int. Cl. A47j 37/12
U.S. Cl. 99—330 **12 Claims**



A method of and apparatus for cooking foodstuffs by immersing them in a heated liquid cooking medium contained in a pressure vessel, closing the vessel and relieving the pressure therein when it reaches a predetermined high limit at which point the burners turn off and the timing cycle begins. The pressure is relieved to a low limit at which point the burners are turned on. The cycle is repeated until the foodstuffs are cooked. The cooking medium is then discharged from the vessel under the urging of the pressure of the steam remaining in the vessel. Upon complete discharge of the cooking medium, the vessel is completely vented of residual steam. The discharged cooking medium, if desired, is filtered of all solid residue and is then ready for reuse.

3,613,551

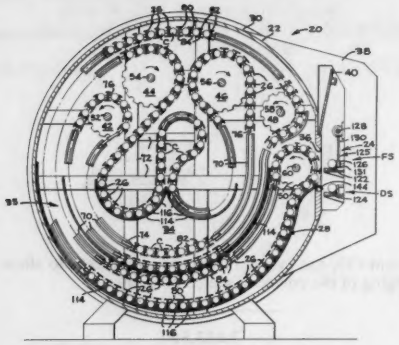
HEAT TREATMENT APPARATUS

James L. Reimers, San Jose, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed Dec. 30, 1968, Ser. No. 787,647
Int. Cl. A23l 3/04
U.S. Cl. 99—360 **20 Claims**

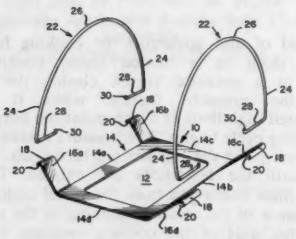
Food-processing apparatus for cooking rows of filled containers within a cylindrical pressure housing and for

supporting the containers in elongated carries of an endless processing conveyor. The conveyor is trained around a multiplicity of drive sprockets near the upper portion of the housing and is draped therefrom and guided along a plurality of looped paths below the drive sprockets as well as along an arcuate path above the sprockets to more fully utilize the holding capacity of the housing. The plurality of drive sprockets are arranged to cause a plurality of direction changes and to permit the conveyor to be driven at high



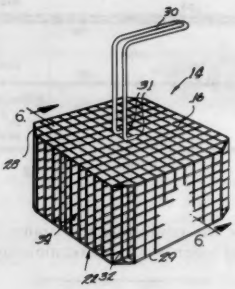
speeds during processing thereby agitating the contents of the containers to affect more efficient heat transfer. Additional agitation may be imparted to the containers by permitting them to project downwardly from the carriers against curved retaining plates during a portion of their travel through the cooker. The cooker also includes an improved feed and discharge mechanism for feeding rows of containers into and discharging rows of containers from the housing of the pressure cooker through one end thereof.

3,613,552
FOWL SLING
George W. Kean, Woodland Drive, Granby, Conn.
Filed May 20, 1970, Ser. No. 39,026
Int. Cl. A47j *43/18*
U.S. Cl. 99—426 **5 Claims**



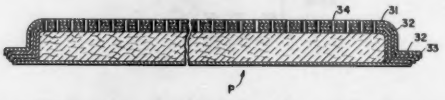
A sling for use in roasting fowl and the like and comprising a thin flat one-piece rectangular body having a large central opening and a pair of generally upwardly projecting arms on each side. Each arm has a hooklike formation at its upper and free end comprising a downwardly open groove. A pair of similar bails each has a generally U-shaped inverted configuration with short horizontally inwardly projecting feet and short upwardly projecting toes. The feet of the bails are disposed beneath the associated hooklike formations on the arms for easy attachment and detachment and for raising and transporting fowl or other roasts from a roasting pan.

3,613,553
APPARATUS FOR PUFFED POTATO PRODUCT
Samuel J. Popeil, Chicago, Ill., assignor to Popeil Brothers, Inc., Chicago, Ill.
Division of Ser. No. 497,849, Oct. 10, 1965, Pat No. 3,484,252
Filed July 14, 1969, Ser. No. 841,338
Int. Cl. A47j *43/18*
U.S. Cl. 99—426 **3 Claims**



A hot oil bath rack for making intermediate potato puffs, said rack having a plurality of compartments to partially puff raw potato slices, said compartments having perforated portions to admit hot oil and having a lid to constrain the slices in substantially vertical orientation, and said compartments having a width from about one-half to about one inch to limit the partial extension of the intermediate potato puff.

3,613,554
LAMINATED COOKING PAD AND METHODS OF MAKING SAME
Edward B. Koger, and Dorothy G. Koger, both of 8040 Bobbyboyar Ave., Canoga Park, Calif.
Continuation-in-part of application Ser. No. 445,930, Apr. 6, 1965, now Patent No. 3,415,662. This application Dec. 3, 1968, Ser. No. 780,681
Int. Cl. A47j *27/00*
U.S. Cl. 99—446 **2 Claims**

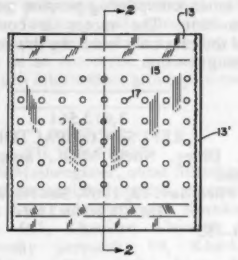


This specification discloses a laminated pad intended to be used in the cooking of foods, particularly meat. The pad is a laminated construction comprising a bottom layer of metallic foil, a comparatively thick intermediate layer of an absorbent material such as cellulose, and a top layer of metallic foil. The top and bottom layers initially are of greater extent than the absorbent layer so that protruding marginal portions may be folded about the side edges and joined to provide a complete envelop about the absorbent layer. The top layer is formed with a multiplicity of small openings through which grease or other food secretions drain to be absorbed the intermediate layer. In a modification a plurality of top foil layers are provided so that one may be peeled off to present a new layer after each usage. A method of fabricating such a pad is also disclosed in which the foil layers are integrally joined at one side so that after the absorbent pad is positioned they are folded and the remaining side edges joined.

3,613,555
DISPOSABLE COOKING GREASE TRAP
Murray Ogman, 32 Annrae St., San Diego, Calif.
Filed May 29, 1969, Ser. No. 829,051
Int. Cl. A47j *27/00*
U.S. Cl. 99—446 **5 Claims**

The invention is directed to a disposable cooking grease trap designed to absorb grease and fat drippings from food

being cooked. Two equal sized sheets of aluminum are joined at their periphery forming a compartment. One of the sheets is perforated to absorb drippings. A core of fluid absorbing



material, such as paper toweling, is contained in the compartment to absorb and trap fluids passing through the perforations.

3,613,556

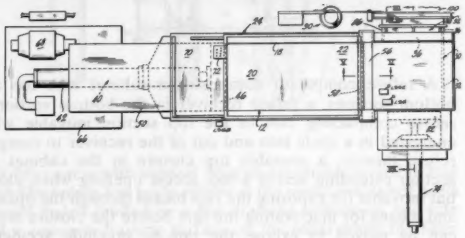
APPARATUS FOR HORIZONTAL BALING

Colin S. Wright, Fort Lauderdale, Fla.; Robert E. Fogelsong, Ann Arbor, Mich.; Jerold W. Johnson, Cordele, and Teja S. Jouhal, Cordele, Ga., assignors to American Hoist & Derrick Company, St. Paul, Minn.

Filed Apr. 22, 1970, Ser. No. 30,837

Int. Cl. B65b *13/04; B30b 15/32, 7/04*

U.S. Cl. 100—14 **11 Claims**



A horizontal baler for baling paper products incorporating a horizontally disposed gathering and compression chamber having an open upper portion communicating with a hopper wherein the paper to be compressed is directly introduced into the hopper and a gatherer and compression ram transfers the paper into a compression chamber to form a parcel of layered compressed material. The paper may be continuously introduced into the hopper as the gatherer ram cycles and a cover plate on the ram receives the paper when the ram is extended, wiping the paper from the cover plate as the ram retracts. Cycling of the gatherer ram continues until a parcel of predetermined compression is achieved, whereupon an ejector or transfer ram perpendicularly disposed to the gatherer ram intermittently transfers the compressed parcel in the direction of the formed compressed parcel layers through automatic strapping apparatus which straps the parcel in a direction perpendicular to the formed layers to define a bale. Gathering, compressing and transferring occurs at substantially the same horizontal orientation, and automatic control means are utilized to permit automatic operation of the apparatus cycle.

3,613,557

ADJUSTABLE PLATEN TRACK

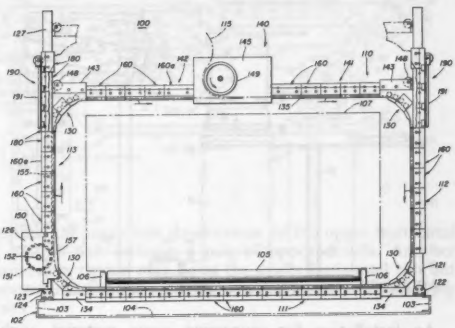
Bestor P. Coleman, Willow Springs, Ill., assignor to Interlake, Inc., Chicago, Ill.

Filed Aug. 6, 1970, Ser. No. 61,656

Int. Cl. B65b *13/04*

U.S. Cl. 100—26 **30 Claims**

A generally rectangular binder strap track includes a stationary section and a movable section movable therealong for varying the track length, a flexible tape being connected to the movable section and extending therefrom along the stationary section and outwardly through an opening therein to a tape supply for facilitating unencumbered passage of the leasing strap end from the stationary section to the movable section; each section includes a backing wall of a width substantially equal to that of the strap and pairs of retainers extending laterally outwardly of the opposite sides of the



backing wall and cooperating therewith to define a strap path substantially wider than the backing wall, each retainer having two flat surfaces thereon intersecting at an angle and having an opening therethrough with the axis thereof passing through the intersection of the surfaces, the openings of each pair of retainers receiving a pin therethrough to mount the retainers for movement between retaining and releasing positions.

3,613,558

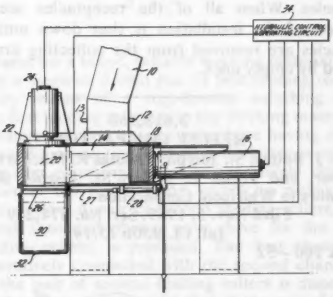
REFUSE COMPACTOR CONTROL ARRANGEMENT

Irwin Math, Beechhurst, N.Y., assignor to International Patents & Development Corp., Kings Point, N.Y.

Filed Aug. 18, 1969, Ser. No. 851,003

Int. Cl. B30b *13/00*

U.S. Cl. 100—35 **14 Claims**

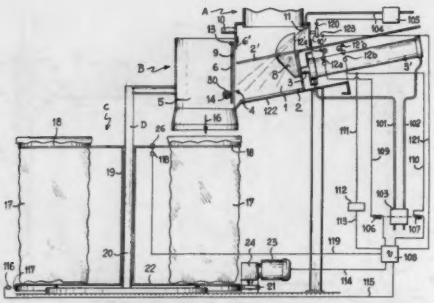


A control arrangement for a refuse compactor in which a photocell cooperates with a time delay device to determine when refuse is being accumulated or has been accumulated in an accumulating chamber for eventual compaction into a bale. A hydraulic cylinder and piston is actuated thereupon to compact the refuse. After the compacted mass is realized, an ejecting door is opened and a hydraulic cylinder and piston ejects the compacted mass from the refuse compactor. The control arrangement coordinates the timing and sequence of operations of a compacting cycle during which a bale is formed and transferred from the compacting machine.

3,613,559
INSTALLATION FOR THE COMPRESSING AND EVACUATION OF HOUSEHOLD GARBAGE AND INDUSTRIAL REFUSE

Marcel Buisson, 3, place des Halles, Chartres (Eure et Lair), France

Filed May 1, 1970, Ser. No. 33,816
Int. Cl. B30b *15/16*
U.S. Cl. 100—49 12 Claims

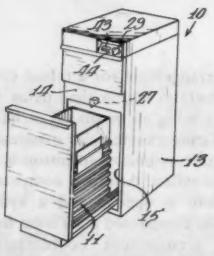


An installation for processing waste material, such as household garbage and industrial refuse, includes a hatch for receiving the waste material from a disposal chute the hatch divided by a pivotally mounted shutter into a space for accumulating the material from the disposal chute and a discharge chamber aligned above a receptacle into which the waste material is packed. Positioned for movement transversely across the hatch space toward the shutter is a hydraulic piston rod which compresses the accumulated material and pivotally displaces the shutter so that the compressed material is transferred into hatch chamber and then drops into a receptacle. A collecting drum supports a plurality of receptacles and is arranged to replace filled receptacles with empty ones. A photoelectric cell senses the level of the accumulated material in the hatch space and through an electrical circuit and hydraulic circuit commences the operation of the hydraulic piston rod for compressing the material. Another member counts the number of piston strokes and actuates the controlled movement of the collecting drum for replacing the filled receptacles. When all of the receptacles are filled the operation of the installation is shut down until the filled receptacles are removed from the collecting drum and are replaced by empty ones.

3,613,560
REFUSE COMPACTOR

Michael J. Bottas, St. Joseph; Thomas R. MacFarlane, Benton Harbor, and Frank E. Miller, St. Joseph, all of Mich., assignors to Whirlpool Corporation

Filed Nov. 5, 1969, Ser. No. 874,249
Int. Cl. B30b *15/14*
U.S. Cl. 100—52 17 Claims

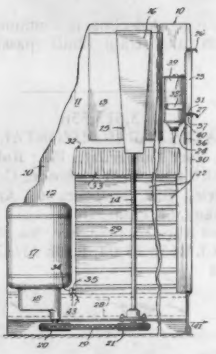


A refuse compactor having a ram movably carried on a support for selective movement into a refuse-holding drawer to compact refuse deposited therein. The ram is driven by an electric motor which is controlled to effect preselected forcible compaction of the refuse and return to a "start" position for subsequent compaction of additional refuse subsequently deposited in the drawer. The drawer is movable between an inner, compacting position and an outer, refuse-receiving position. The motor is controlled to permit operation of the ram only when the drawer is substantially in the compacting position.

3,613,561
REFUSE COMPACTOR

Charles R. Difley, Niles, Mich., assignor to Whirlpool Corporation

Filed Nov. 13, 1969, Ser. No. 876,399
Int. Cl. B30b *15/14*
U.S. Cl. 100—53 8 Claims

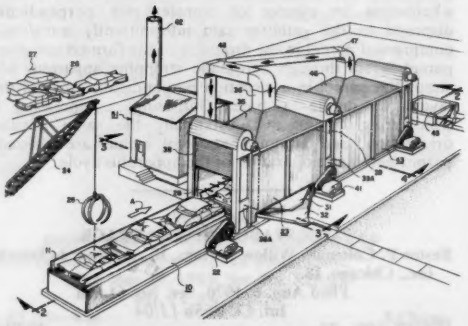


A refuse compactor comprising a cabinet with top and bottom sections, a refuse receiver in the bottom section, a refuse compacting ram in the top section movable when energized in a cycle into and out of the receiver to compact refuse therein, a movable top closure in the cabinet top section extending across a top access opening when closed but movable for exposing the ram means through the opening and means for inactivating the ram before the closure means can be moved to expose the ram to preclude accidental operation of the ram when the closure is open in order to avoid possible injury to the operator of the compactor.

3,613,562
PROCESSING OF AUTOMOBILE BODIES INTO SCRAP

John C. Brewer, Salt Lake City, Utah, assignor to Garbalizer Corporation of America, Salt Lake City, Utah

Filed May 6, 1970, Ser. No. 35,035
Int. Cl. B30b *15/30*
U.S. Cl. 100—74 5 Claims



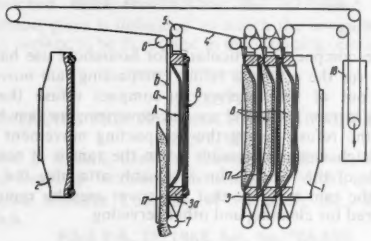
A vehicle body shell processing plant is provided wherein vehicle shells are fired and quenched prior to baling in a

manner such as to avoid air pollution difficulties. Exhaust gases from the furnace and quencher stages of the system are routed through an air-cleaning system such that only clean gases are exhausted from the system. Quenching is done in the system such that steam, entrained particulate matter, and residual exhaust gases are conveyed to a gas scrubbing system for cleansing purposes. Independent conveyors are utilized at feed-in, furnace, and quencher points. The quencher conveyor is designed to have a sloping construction such that there can be an automatic and continuous process to shell bodies for each intermittent group processed.

3,613,563
FILTER PRESS

Mikhail Yakovlevich Meshengisser, ulitsa Sumskaya, 126, kv. 5, Kharkov; Ivan Semenovich Ermakov, prospekt Pravdy 7, kv. 44, Kharkov; Georgy Mikhailovich Kochkin, ulitsa 23 avgusta, 29, kv. 161, Kharkov; Alexandr Viktorovich Stankun, Karpovsky pereulok, 10, Kharkov; Filipp Nikolaevich Shakhov, ulitsa chaikovskogo, 25, kv. 23, Kharkov; Ilya Pinkhusovich Velednitsky, ulitsa K. Libknekhta, 32/1, kv. 19, Berdichev, and Petr Petrovich Yagodin, ulitsa pushkinskava, 54, kv. 1, Berdichev, all of U.S.S.R.

Filed May 12, 1970, Ser. No. 36,652
Claims priority, application U.S.S.R., July 7, 1969, 1345953
Int. Cl. B30b *9/06;* B01d *25/32*
U.S. Cl. 100—115 2 Claims



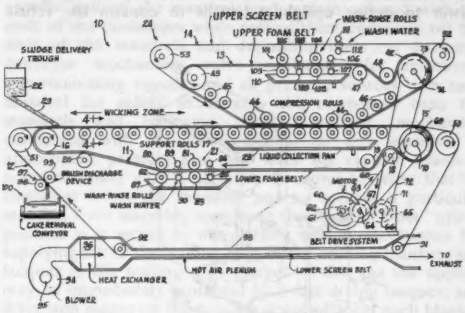
A filter press with vertical filter plates characterized in that each filter plate has guide rollers at the upper and lower parts thereof and is limited by a flat draining surface on one side and a concave draining surface on the other while the filter cloth in the form of a continuous band passes consecutively between the adjacent filter plates so that, resting on the guide rollers, it covers twice the draining surface of each filter plate. When the filter plates are spread apart one after another in the direction of the longitudinal axis of the set, the length of the filter cloth adjoining the filter plate being moved is also shifted with relation to the latter, thus carrying outside the cake formed in the filtering chamber.

3,613,564
SLUDGE-DEWATERING APPARATUS

Maximilian Adamski, Wheeling, and Donald S. Schover, Highland Park, both of Ill., assignors to General American Transportation Corporation

Filed Aug. 13, 1969, Ser. No. 849,770
Int. Cl. B30b *9/24*
U.S. Cl. 100—118 15 Claims

An apparatus for removing aqueous liquid from a flowable material, containing aqueous liquid as a continuous phase and suspended solids as a discontinuous phase, to obtain a dewatered product has two endless, driven belts of elongated porous sheets. The belts are supported so that one belt has its path of travel inside that of the other belt and with an upper horizontal run of the outer belt overlying and abutting that of the inner belt moving in the same direction. The sheet of the inner belt is resilient, compressible and made of cellular material capable of absorbing aqueous liquid by a wicking action, whereas the sheet of the outer belt is a fine-mesh sheet with pores providing passage of the liquid through the sheet by a wicking action of the abutting cellular sheet while retaining most of the solids on the outer belt. A feeder for delivering the flowable material onto the outer belt is mounted adjacent the beginning of the dewatering zone where there is the wicking action due to the abutment of the two belts along that zone. A device for removing dewatered product is mounted downstream of that zone. A device to

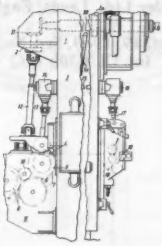


compress the inner belt downstream of the upper horizontal run of that belt includes a pair of opposed rolls. Another compression device may be at the upper horizontal run but downstream of the dewatering zone at which initial wicking occurs.

3,613,565
APPARATUS FOR A SETTABLE WORKING MATERIAL FEED IN PRESSES IN FORM OF CYCLES

Roger Muller, Neuilly sur Seine, France, assignor to Etablissement D. F., Paris, France

Filed May 12, 1969, Ser. No. 823,678
Int. Cl. B30b *15/30*
U.S. Cl. 100—215 7 Claims



An apparatus for a timed, settable working material feed in presses with a stepwise driven pair of first feeding rollers by the press by means of a step-by-step switching device, wherein the first feeding rollers grip the working material in a clamping manner. A first change gear drive having a coarse setting step and a correction- or fine-setting step is provided. The step-by-step switching device is operatively connected with the pair of the first feeding rollers by means of the change gear device. A pair of second feeding rollers, is also arranged and a second change gear drive for the pair of second feeding rollers, is provided. The first change gear drive is operatively connected with the second change gear drive, and the pair of second feeding rollers is disposed on the side of the apparatus opposite that of the pair of the first feeding rollers.

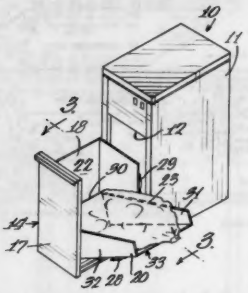
3,613,566
REFUSE COMPACTOR

Lloyd P. Shapleigh, Jr., 2896 Mansueto Drive, Stevensville, Mich., and Charles R. Difley, 2309 Emerald Drive, Niles, Mich.

Filed Oct. 20, 1969, Ser. No. 867,746
Int. Cl. B30b *15/32*
U.S. Cl. 100—218 12 Claims

A refuse compactor having a ram adapted to move downwardly into a drawer to compact refuse deposited in the

drawer whereby a substantial quantity of refuse may be collected in a limited space. The compactor is adapted for use in a household kitchen for compacting household refuse. The drawer is provided with a movable sidewall permitting the user, such as a housewife, to remove the compressed refuse laterally from the drawer while yet arranging the drawer to define upright sidewalls to contain the refuse

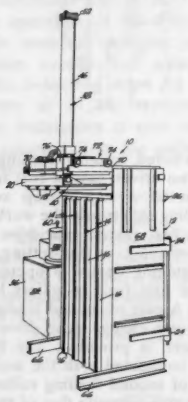


effectively positively therein during compacting thereof by the ram means. Manually operable means are provided for selectively latching the sidewall in the upright position. The refuse may be collected in a bag in the drawer whereby the compacted refuse therein may be readily removed by the lateral removal of the bag with the movable sidewall portion in a downwardly disposed arrangement.

3,613,567
BAILING PRESS

Anthony Loughran, Farsley, England, assignor to Supermarket Service, Inc., Fort Lauderdale, Fla. and Greenwood & Batley Ltd., Leeds, England, part interest to each

Filed Sept. 19, 1969, Ser. No. 859,309
Int. Cl. B30b *1/32*
U.S. Cl. 100—226 **4 Claims**

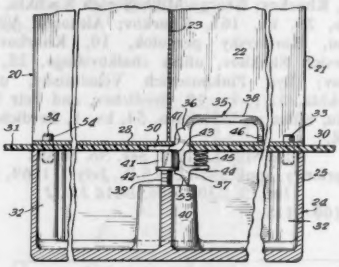


A baling press with a rectangular press box defining a workstation for receiving material to be bale pressed therein. The sidewalls of the press box extend above the workstation and include upper rails which extend backwards beyond the defined workstation. A carriage is mounted on the rails for back and forth movement having a carriage hub. Mounted in the hub is piston ramrod assembly with a piston cylinder over the hub and the ramrod extending out of the cylinder below the hub. A press platen attached to the ramrod acts on the material in the workstation. When the platen is in position at the top of the workstation it can move backwards when the carriage is pushed back along the rails. The piston ramrod assembly is operated by a hydraulic pump unit having flexible conduits connected to the piston cylinder. The pump unit can be moved about to a convenient location in the vicinity of the workstation.

3,613,568
REFUSE COMPACTOR RAM COVER

Michael J. Bottas, St. Joseph; Charles R. Difley, Niles, and Frank E. Miller, St. Joseph, all of Mich., assignors to Whirlpool Corporation

Filed Nov. 13, 1969, Ser. No. 876,400
Int. Cl. B30b *15/06*
U.S. Cl. 100—229 **13 Claims**

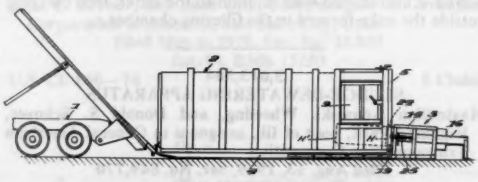


A refuse compactor particularly for household use having a receiver for the refuse, a refuse compacting ram movable into and out of the receiver to compact refuse therein comprising a ram body and an end cover on the ram body engaging the refuse during the compacting movement and movable latch means accessible when the ram is at rest on the outside of the receiver for releasably attaching the ram cover to the ram body so that the cover may be removed when desired for cleaning and other servicing.

3,613,569
STATIONARY PACKER ASSEMBLIES

Harvey W. Liberman; James A. Wade, and Steven C. Voorhees, all of Knoxville, Tenn., assignors to Dempster Brothers, Inc., Knoxville, Tenn.

Division of Ser. No. 703,995, Feb. 8, 1968, Pat. No. 3,507,410
Filed Nov. 14, 1969, Ser. No. 876,883
Int. Cl. B30b *1/32*
U.S. Cl. 100—229 **6 Claims**



A refuse packing and transporting assembly wherein the refuse is placed directly in a transport container while the container is connected with a packer device which is operated to compress the refuse therein. The packer device comprises a relatively simple frame structure mounted in position to have the transport container brought into juxtaposition thereto with an opening in the end of the transport container into and through which a head in the packer operates to compress the refuse in the container after deposit directly into the container. After a suitable quantity of refuse has been packed in the container, the latter may be disconnected from the packer and hauled away for discharging the refuse therefrom.

3,613,570

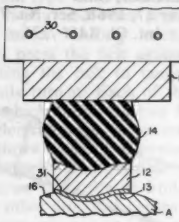
HOT STAMPING DIE STRUCTURE FOR HOT STAMP DECORATING

Carl F. Gladen, 3530 Wheeler Drive, Bay City, Mich.

Continuation-in-part of application Ser. No. 603,778, Dec. 22, 1966, now abandoned. This application June 11, 1969, Ser. No. 832,184

Int. Cl. B44b *5/02*

U.S. Cl. 101—9 **9 Claims**



A hot stamping die for decorating the irregular surface of an article utilizing a laminated die comprised of a pair of spaced-apart plates having a layer of resilient material sandwiched therebetween. the die is heated and the outermost plate is deformed to match the irregular contour of the surface to be decorated in the stamping operation.

3,613,571

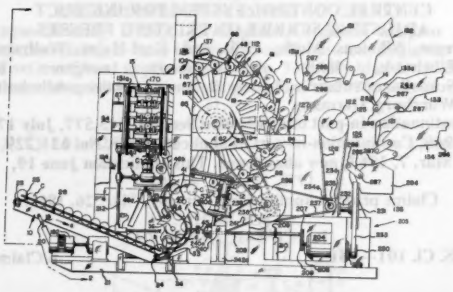
CONTAINER PRINTING MACHINE AND METHOD OF PRINTING

Edward J. Russell, Gladwin; Gaylord W. Brown, Beaverton, and Dennis J. Dorman, Coleman, all of Mich., assignors to Brown Machine Company of Michigan, Inc., Beaverton, Mich.

Filed Feb. 27, 1968, Ser. No. 708,690

Int. Cl. B41f *17/22;* **B65g** *47/86*

U.S. Cl. 101—40 **40 Claims**



High-speed printing or decorating apparatus capable of printing information and decoration in a variety of colors on container sidewalls and the like, and with quality half tones and fine type, including: a rotary mandrel drum having a series of circumferentially spaced mandrel lever assemblies with generally tangentially disposed, laterally projecting mandrels thereon mounted on each side of the drum "in line" with a rotary printing drum having offset printing blankets on its peripheral face which are revolved past the mandrel drum at a printing station; container supply and separating mechanism for individually moving containers to a position opposite the peripheral path of the mandrels; and endless transfer conveyor mounted opposite the peripheral path of travel of the mandrels and carrying cam-controlled pusher members which follow the arcuate path of the mandrels and at the same time move toward the mandrel drum to push containers endwise onto the mandrels upstream of the printing station; and endless transfer conveyor mounted opposite the peripheral path of travel of the mandrels downstream of the printing station and carrying cam-controlled suction cup, container removing members, for engaging the end walls of the containers, which follow the arcuate path of the mandrels and remain squared with the ends of the containers while pulling them endwisely off the ends of the mandrels and depositing them on discharge conveyor mechanism; valve mechanism for selectively communicating vacuum and air pressure sources with each mandrel for aiding in drawing the containers onto the mandrels and removing them therefrom; mechanism connected with the valve mechanism and sensitive to atmospheric pressure at a time when the vacuum source is communicating with a particular mandrel to sense that no container is on the mandrel and to actuate a particular mandrel lever assembly to remove the mandrel from "print" position as it moves to the printing station; mechanism for supplying ink to the leading ends of the printing blankets and lacquer to the trailing ends thereof so that the ink applied may be immediately protected by a fast drying lacquer; and drive step means on the printing drum adjacent each blanket and of greater thickness than the blankets for spinning the containers through a controlled number of revolutions relative to the blankets when the mandrels reach the printing station.

3,613,572

SELECTIVE-TRANSFER PRINTING MACHINE

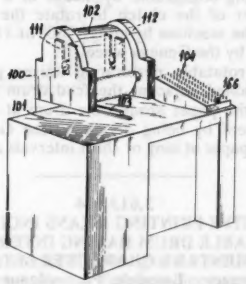
Nicolas Gretchikhine, Paris, France, assignor to Societe Ormig

Filed Dec. 27, 1968, Ser. No. 787,531

Claims priority, application France, Dec. 29, 1967, 134.237

Int. Cl. B41l *47/46, 47/58*

U.S. Cl. 101—91 **1 Claim**



The rotation and printing control devices of the plate-carrying cylinder, as well as the means actuating the pincers, each comprise an electromagnetic arrangement placed under the control of an electronic matrix connected, on the one hand, to a bank of electric switches which are manually selectable, and, on the other hand, to a photoelectric exploration system for a reference code of the angular positions of the plate-carrying cylinder corresponding to the lines of a plate mounted on the said cylinder, this code being connected to the plate-carrying cylinder and preferably integral with it.

3,613,573

PRINT SELECTION AND PAPER FEED ADJUSTING MEANS IN POSTAL FRANKING MACHINES

James Woodhead, Gloucestershire; David Alan Hedley, Essex, and Maurice Revie Jardine, Essex, all of England, assignors to Roneo Limited, Crydon, Surrey, England

Filed Aug. 7, 1968, Ser. No. 750,824

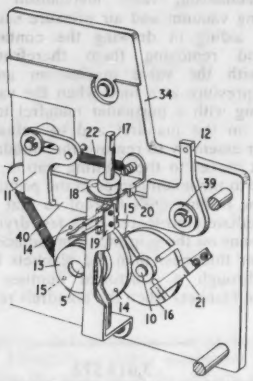
Claims priority, application Great Britain, Aug. 17, 1967, 37,992/67

Int. Cl. B41f *13/04;* **B41l** *47/46;* **B65h** *25/00*

U.S. Cl. 101—92 **9 Claims**

A franking machine of the kind adapted to provide printed labels for attachment to postal packets which cannot be inserted into the machine for franking in the normal way in

which the length of label to be issued by the machine is controlled by a Geneva wheel which is rotated alternatively either one-half or one complete revolution by a rotatable member having long and short pins. These pins engage in slots in the Geneva wheel while the rotatable member is movable axially into alternative positions by a manual control to engage all the pins with the slots or only the long pins with



the slots. The paper strip from which the labels are cut passes around a feed drum the circumference of which is equal to the length of a long label and the drum is rotated by way of a dog clutch mechanism the driving member of which is continuously rotated by an electric meter on the machine, the clutch being engageable by means of a sprag with the driven member of the clutch to rotate the drum at each operation of the machine by either 360° or 180° by means of a cam rotated by the Geneva wheel.

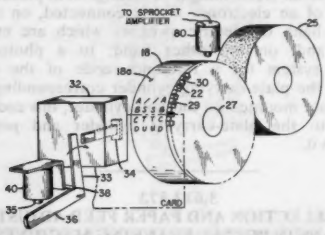
A pair of rotatable perforating knives positioned 180° apart is positioned adjacent the feed drum and rotate into contact with the paper around the drum at the appropriate positions thereof by being driven by the Geneva wheel to perforate the paper at long or short intervals as necessary.

3,613,574

SELECTIVE PRINTING MEANS INCLUDING A ROTATABLE DRUM HAVING INTERSPERSED COMPLEMENTARY CHARACTER SETS THEREON

Richard L. Longcoy, Lansdale, Pa., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Feb. 10, 1969, Ser. No. 797,979
Int. Cl. B41j *1/34*
U.S. Cl. 101—93 **17 Claims**



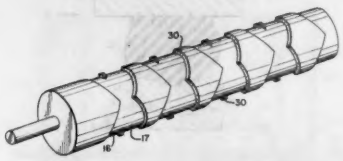
This invention relates to a printer device that prints on a medium which moves incrementally in a horizontal position. The print drum is arranged into sets of print wheels wherein a first set comprises print wheels which carry one-half of the characters and a second set which comprises print wheels that carry the remaining characters. The print wheels of a set carry identical characters and therefore are the duplicate of one another. To insure being able to print the required information at a particular position, the medium is incremented horizontally in steps so that the print position is opposite a wheel of one set during the first push and then is moved so that the same column position is opposite a character wheel of the second set after the second push. If the character is not printed by a print wheel of the first set it is automatically printed by a print wheel of the second set.

3,613,575

OSCILLATOR ROLLER FOR PRINTING PRESSES

Paul R. Kantor, Cleveland, Ohio, assignor to Kantor Press Kontrols, Inc., Cleveland, Ohio

Filed May 27, 1968, Ser. No. 732,302
Int. Cl. B41f *7/36*
U.S. Cl. 101—148 **9 Claims**



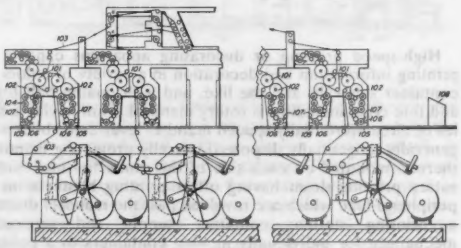
An oscillator roller for a printing press which achieves a superior breakup and distribution of the substances with which it comes into contact, and which comprises an elongated cylinder having one or more spiral bands or raised lands formed along its surface and which extends longitudinally therealong. When more than one spiral band or land is utilized, they are normally found in opposition to each other. The oscillator roller when used in the dampener of an offset printing machine is normally in surface-to-surface contact with one of the form rollers, as referred to, and is operable to distribute the dampening solution evenly over the surface of the form roller prior to its application to the printing plate. The oscillator roller may also be used in like manner in the inking system of a lithographic or conventional printing press to provide substantially even distribution of the ink prior to its application to the printing plate.

3,613,576

CENTRAL CONTROL SYSTEM FOR INK DUCT ADJUSTING SCREWS ON PRINTING PRESSES

Gregor Nikolaus Muth, Zell, and Karl-Heinz Wolfram, Eibelstadt, both of Germany, assignors to Schnellpressenfabrik Koenig & Bauer, Aktiengesellschaft, Wurzburg, Germany

Continuation-in-part of application Ser. No. 745,577, July 17, 1968, Continuation-in-part of application Ser. No. 621,229, Mar. 7, 1967, now abandoned. This application June 19, 1970, Ser. No. 47,263
Claims priority application Germany, Mar. 26, 1966, Sch 38741
Int. Cl. B41f *5/16, 31/04*
U.S. Cl. 101—181 **6 Claims**



In printing newspapers or the like where the number of pages that are printed by plates are frequently rearranged in various positions on the rotary printing cylinders it becomes a problem to provide for adjustment of the inking of each individual plate. The inking plate is positioned with respect

to a duct roller by screws spaced along the plate. These screws may be screwed in and out by a pair of endless belts that are pushed against the screw to rotate it for "in" or "out" adjustment. A solenoid mechanism operated by an electromagnet pushes the belt running by a particular screw into engagement with the screw to turn it as desired. One of the pair of belts is for turning it in one direction and the other is for turning the screw in the opposite direction. There is provided a control at the central control station for turning on and off a particular motor driving a pair of belts for a particularly positioned plate for a certain page. The control may be a push button type of switch that when first pressed down turns on the motor and when pressed down a second time stops the motor. Along each belt there are electromagnets that press the belt against a screw for that electromagnet causing the belt to tangentially engage the screw and frictionally turn it. Each of the respective screw electromagnets of which there are two for each screw are connected in an electrical control circuit in parallel to a respective double throw switch. Movement of the switch in one direction causes energization of the proper electromagnet to screw the screw in while movement of the toggle switch in the other direction causes the energization of the companion electromagnet to cause the screw to be screwed out. In order to maintain the same push button for the same page number plate regardless of where the plate is positioned on the printing cylinders for a set up of printing, there is provided a key, code means or patch means. Such a means is interposed in the control circuits leading from the motor push buttons and power supply so when connected as desired for a particular printing page set up, the operator on pressing the push button for plate motor No. 1, for example, controlling the inking mechanism belts for plate 1, causes that motor to be actuated. The operator then moves the desired toggle switch in the desired direction and the electromagnet acts to press the moving belt for that electromagnet against the adjusting screw for that portion of the inking blade. When another set up of printing is desired, the push buttons for the motors are rewired for the respective plate positions and the inking mechanism therefore by utilization of the code or patch wiring means for the particular desired set up. The respective push buttons for controlling the motors remain the same for the respective plates irregardless of where the plates are positioned.

3,613,577

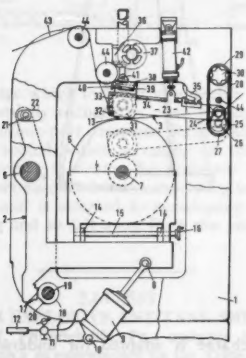
ROTARY WEB PROCESSING MACHINES

Angus Murray Halley, Birmingham, England, assignor to James Halley & Sons Limited, West Bromwich, England

Continuation of application Ser. No. 546,939, May 2, 1966, now abandoned. This application June 4, 1970, Ser. No. 41,768

Int. Cl. B41f *13/40*

U.S. Cl. 101—247 **1 Claim**



A rotary web processing apparatus in which an impression cylinder is movably mounted to permit radial adjustment during setting up of the apparatus but is fixed during a web processing operation. A processing cylinder is cradle-mounted to permit radial adjustment of the processing cylinder and movement without restriction during the web processing operation to maintain the nip pressure between the impression and processing cylinders. An abutment means fixes the radial position of the processing cylinder and its mounting cradle during setting up, but during web processing the abutment means permits unrestricted radial movement of the processing cylinder.

3,613,578

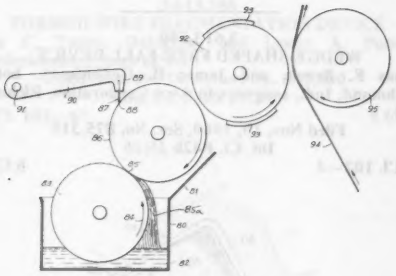
INK METERING ROLL FOR USE INTERMEDIATE A FOUNTAIN ROLL AND A PRINTING ROLL

Charles Heurich, Hanover, N.J., assignor to Pamarco Incorporated, Roselle, N.J.

Filed Aug. 18, 1969, Ser. No. 850,744

Int. Cl. B41f *31/06, 31/10*

U.S. Cl. 101—350 **2 Claims**



The disclosure sets forth a flexographic printing procedure utilizing metering rolls for flexographic processing, which metering rolls produce tone and color process printing of consistently and uniformly high quality throughout one press run and also from one press run to another. These metering rolls, which have from 250 to 600 cells per inch in any direction or from 62,500 cells to 360,000 cells per square inch of surface have a mean of about 160,000 cells per square inch of surface area. These cells are smaller in area than the smallest highlight dot produced by engraving. The recess is quite shallow, having a maximum depth of about 12 microns or less than one-half thousandth of an inch. The shape of each cell is essentially that of a hemisphere, with polished, smooth walls.

3,613,579

ANTIPERSONNEL FRAGMENTATION WEAPON

Nathaniel B. Wales, Jr., Morristown, N.J., assignor to The United States of America as represented by the Secretary of the Army

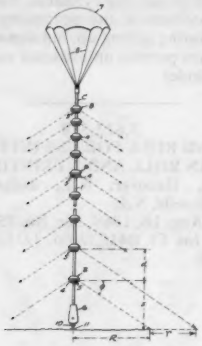
Filed Dec. 1, 1954, Ser. No. 472,543

Int. Cl. F42b *25/00*

U.S. Cl. 102—4 **4 Claims**

1. In an explosive fragmentation assembly, a length of explosive cord having airborne suspension means at one end and an impact fuze at the other end, a plurality of inverted frustoconical pellets secured in spaced relation on and along said cord in progressively decreasing intervals from said impact fuze to said airborne suspension means, each said frustoconical pellet having a side surface formed at a predetermined angle, and a frustoconical casing snugly

embracing the side surface of said frustoconical pellet and having a series of grooves in its surface defining fragments to



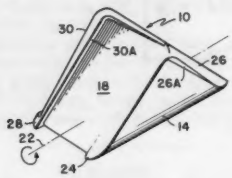
be projected in a line substantially normal to the side surface of said frustoconical pellet on detonation of said impact fuze.

3,613,580

WEDGE-SHAPED FREE-FALL DEVICE

Thomas E. Bench, and James H. Coffenberry, both of Richmond, Ind., assignors to Avco Corporation, Richmond, Ind.

Filed Nov. 10, 1969, Ser. No. 875,319
Int. Cl. F42b *25/16*
U.S. Cl. 102—4 **6 Claims**



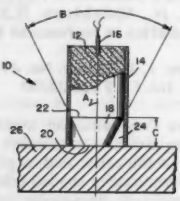
A free-fall device is disclosed which has a generally wedge-shaped body. Flutes or vanes are provided on all of the triangular faces of the body which cause the body to autorotate and glide when freely falling through the air.

3,613,581

EXPLOSIVE DEVICE FOR PERFORATING HIGH-STRENGTH METAL PLATES

John Pearson; William B. McLean, and Lawrence N. Cosner, all of China Lake, Calif., assignors to The United States of America as represented by the Secretary of the Navy

Filed Nov. 20, 1964, Ser. No. 413,678
Int. Cl. F42b *1/00*
U.S. Cl. 102—24 **5 Claims**



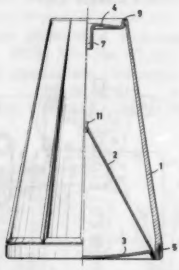
An explosive device for removing a circular pluglike fragment from a metal plate structure, comprising; (a) cylindrical metal outer casing tube having front and rear ends and containing a charge of explosive material, (b) said charge having a first, cylindrical, axial portion in circumferential contact with the inner surface of the wall of said tube and extending forwardly to a circular forward limit of explosive charge and tube contact, and having a second, front end, axial portion adjoining and extending forwardly from said circular forward limit and terminating at its forwardmost portion at an axial position substantially coadjacent the front end of the tube, said front end axial portion forming an axially aligned forwardly converging body of revolution having its outer surface in radially spaced relationship to the wall of the tube defining an annular cavity thereabout between the bare outer surface of the explosive material and the inner surface of the wall of said tube, said annular cavity being of forwardly increasing cross section forming an explosive pressure focusing cavity for concentrating the initial explosive effect in axially forwardly and laterally outward directions to produce a semitoroidal crater having a median crater diameter approximately coextensive with the diameter of the tube in the surface of a metal target plate disposed adjacently and normally to the front end of the tube at the time the charge is exploded, (c) said charge being made of an explosive material of such a character that it produces a time distribution of dynamic explosive loading effects by which the high level of explosive loading is sustained momentarily after formation of the semitoroidal crater to produce a punchlike explosive loading upon the surface of the target plate encircled by the crater tending to cause an approximately frustoconical fracture surface extending from the bottom of the crater to the opposite side of the plate and divergent in the direction toward said opposite side, whereupon the portion of the plate encompassed by the crater and fracture surface is removed from the body of the plate.

3,613,582

HOLLOW CHARGE HAVING A DIRECTED EXPLOSIVE EFFECT

Reijo Levamaki, Pitajanmaentie 15, Helsinki; Mikko Vehvilainen, Jokela, and Tapani Suhonen, Suonotk.t. 5 E, Helsinki, all of Finland

Filed July 31, 1968, Ser. No. 749,067
Claims priority, application Finland, Oct. 19, 1967, 2812/67
Int. Cl. F42b *1/02*
U.S. Cl. 102—24 HC **4 Claims**



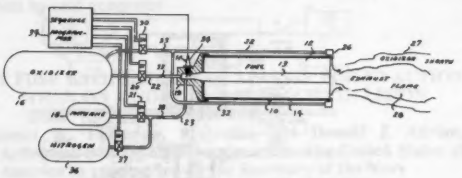
A hollow charge is adapted for underwater demolition operations and has a directed explosive effect, the charge being provided with a cavity at its front end relative to the direction of the explosion, the cavity enlarging towards the front end. The charge has metal walls or a metal sheathing so that, on the occurrence of the explosion, a part of the metal

is formed into a thin metal stream which is directed forwards at high speed. The charge comprises an outer cone forming the shell of the charge, and a regularly shaped inner cone at the front part of the charge, enlarging towards its front end, the cones forming the cavity. A cover seals the back part of the outer cone and a base closes the front part.

3,613,583
ALTITUDE-COMPENSATED HYBRID INFRARED FLARES

William Lai, Los Altos, and John C. Trowbridge, Saratoga, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force

Filed May 5, 1969, Ser. No. 821,596
Int. Cl. C06d *1/10*
U.S. Cl. 102—37.8 **1 Claim**

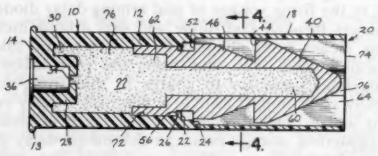


A hybrid infrared flare is ignited by first igniting a methane-oxidizer mixture with a spark which in turn ignites the fuel grain. Burning is sustained by a continuous flow of oxidizer through the upstream oxidizer injector. Oxidizer is also supplied at the downstream end of the flare to provide an oxidizer sheath around the exhaust flame so that the oxidizer mixes with the fuel-rich exhaust products of the flare to enhance the infrared output regardless of the altitude at which the flare is located. Nitrogen is supplied at the upstream end of the flare to quence combustion between burns when the flares are used in multistart operation.

3,613,584
GUN CARTRIDGE

Grover E. Hendricks, 2241 Lake St., Niles, Mich.

Filed Oct. 16, 1968, Ser. No. 767,995
Int. Cl. E21b *43/06*
U.S. Cl. 102—38 **1 Claim**



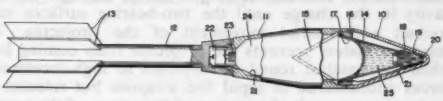
A gun cartridge which includes a projectile having a body which is substantially reduced in cross section intermediate its length. A multiple-part casement fits around the projectile and is snugly seated within a casing of the ammunition cartridge and serves to center the projectile in the casing. The multiple-part casement has parts fitting in said reduced projectile part and is adapted to accompany the projectile from the casing and to fall away from the projectile during flight.

3,613,585
HIGH EXPLOSIVE ANTITANK SHELL

Stanley Dubroff, Philadelphia, Pa., assignor to The United States of America as represented by the Army

Filed Oct. 24, 1958, Ser. No. 769,515
Int. Cl. F42b *13/04, 13/10, 15/26*
U.S. Cl. 102—52 **4 Claims**

1. In a projectile of the hollow charge type wherein a jet of metal is formed by the detonation of an explosive material in response to the impact of said projectile, said projectile having a body, an ogive forward of said body, said ogive being hollow; the combination therewith of the improvement whereby the behind the barrier effectiveness of the projectile is increased, said improvement comprising: a container mounted within said ogive, said container being imperforate and enclosing an inflammable material, said inflammable

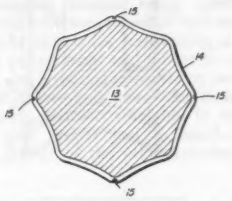


material being distributed substantially uniformly and continuously in both longitudinal and transverse directions such that there is always a mass of said inflammable material along the axis of said projectile, whereby, upon detonation of said projectile the jet formed thereby, traveling along the axis of said projectile, passes through said inflammable material carrying a substantial part of said inflammable material through and behind a target barrier.

3,613,586
FORMED WIRE FRAGMENTATION DEVICE

James C. Talley, Dahlgren, and Lester A. Potteiger, Fredericksburg, both of Va.

Filed Sept. 26, 1966, Ser. No. 582,800
Int. Cl. F42b *13/48*
U.S. Cl. 102—67 **9 Claims**

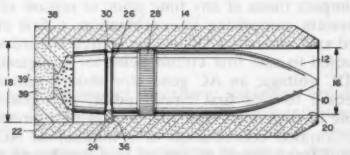


A formed wire fragmentation ordnance device consisting of a coiled wire casing that has been bent so as to be fluted longitudinally of the device so that said flutes form a plurality of generally concave portions connected by peaks and in which notches are provided on alternate peaks so that each concave portion will separate at one end before the other, thereby permitting end-first impact. A shaped charge at alternate peaks may be used instead of the notches. The flutes may be parallel or helical with respect to the axis of the casing and the casing may be cylindrical or oval in shape.

3,613,587
PROJECTILE RETENTION SYSTEM FOR CASELESS AMMUNITION

Elliott L. King, Edison, N.J., assignor to Hercules Incorporated, Wilmington, Del.

Filed Feb. 24, 1970, Ser. No. 13,403
Int. Cl. F42b *5/18*
U.S. Cl. 102—40 **6 Claims**



A projectile retention system is provided for caseless ammunition in which the projectile is at least partially housed

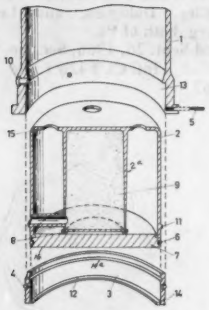
within the axial cavity extending throughout the propellant charge. The projectiles employed have a groove about the circumference of the projectile. A consumable ring having a greater outside diameter than the projectile is secured in the projectile groove. The surface area of the snapring extending beyond the outside diameter of the projectile provides a bearing surface for the projectile. A second bearing surface is provided within the propellant charge. The projectile assembled with the consumable ring is moved through the axial cavity in the charge until the two-bearing surfaces make contact and restrict movement of the projectile. This retension system prevents the projectile from coming loose when the caseless round is subjected to high-deceleration forces encountered in rapid fire weapons but releases the projectile as a result of initiation of the primer of the caseless round.

3,613,588

REPLACEABLE IGNITION UNIT FOR A RECOILLESS GUN CARTRIDGE

Ulf Edlund, Eskilstuna, Sweden, assignor to Forsvarets Fabriksverk, Eskilstuna, Sweden

Filed Aug. 4, 1969, Ser. No. 847,188
Int. Cl. F42c 1/10
U.S. Cl. 102—44 **3 Claims**



Cartridge cases provided with an ignition cap on their sidewalls usually require some device to transmit the ignition cap energy evenly to the full cross section of the powder charge and this invention includes a replaceable flange ring that enables a full-caliber ignition unit housing to be introduced into the rear end of a cartridge case. This makes it easier to find the proper location of the ignition unit housing relative to the ignition cap. The cartridge case body can as a result, be used for several rounds.

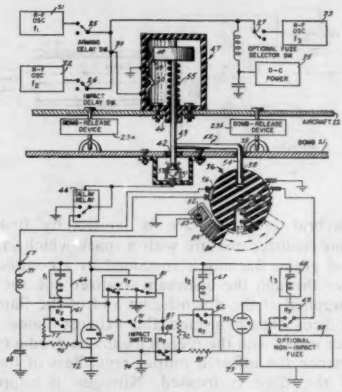
3,613,589

BOMB FUZING SYSTEM

Maurice Apstein, Bethesda, Md.; Evert Blomgren, Kensington, Conn.; George R. Keehn, Washington, D.C.; Laurence M. Andrews, Silver Spring, and Jacob Rabinow, Takoma Park, Md., assignors to The United States of America as represented by the Secretary of the Army

Filed Dec. 23, 1955, Ser. No. 555,216
Int. Cl. F42c 11/06, 15/12, 13/04
U.S. Cl. 102—70.2 R **1 Claim**

1. An aircraft bomb fuzing system that permits the selection of alternative arming-delay and detonation-delay-after-impact times at any time prior to release of the bomb, said system comprising in combination: a first circuit point aboard said aircraft; a DC power source aboard said aircraft connected to said first circuit point for energization thereof with DC voltage; an AC generator aboard said aircraft also connected to said first circuit point, said generator being capable of selectively applying to said first circuit point any predetermined combination of a number of AC signals of different frequencies; means on said bomb and said aircraft for supporting said bomb prior to release thereof; an electrical input terminal aboard said bomb; an extensible and disconnectable conductor means connected between said input terminal and a grounded point on said aircraft for maintaining said input terminal grounded prior to release of said bomb, said conductor means being so constructed and arranged that as the bomb falls away from said aircraft after release thereof, said conductor means first disconnects itself from said grounded point on said aircraft as the bomb begins to fall, the makes momentary electrical contact with said first circuit point after said bomb has fallen a short predetermined distance, and then disconnects itself from said input terminal after said bomb has fallen an additional predetermined short distance, the DC voltage of said DC power source and the predetermined combination of AC signal frequencies from said AC generator thereby being momentarily applied to said input terminal aboard said bomb as said bomb falls away from said aircraft; capacitive storage means within said bomb connected to said input terminal, said capacitive storage means being adapted to charge to the DC voltage of said



power source as a result of the momentary application of said DC power source to said input terminal as the bomb falls away from the aircraft; an arming-delay resistance means and an arming-delay capacitor in series across said capacitive storage means; an arming-delay gas diode and an impulse responsive arming means in series across said arming-delay capacitor, said DC voltage on said capacitive storage means flowing through said arming-delay resistance means to charge said arming-delay capacitor which upon attaining a voltage equal to the firing voltage of said arming-delay diode rapidly discharges through said diode and said arming means, said arming means being adapted to thereupon arm said bomb, the arming-delay time thus being the time taken by said arming-delay capacitor to charge to said firing voltage; a normally open impact switch, a detonation-delay resistance means and a detonation-delay capacitance in series across said capacitive storage means; a detonation-delay gas diode and a detonator in series across said detonation-delay capacitor, said impact switch being adapted to close on impact so that said capacitive storage means flows through said detonation-delay resistance means to charge said detonation-delay capacitor which upon attaining a voltage equal to the firing voltage of said detonation-delay diode rapidly discharges through said diode and said detonator, said detonator being adapted to thereupon detonate said bomb, the detonation-delay-after-impact time thus being the time taken by said detonation-delay capacitor to charge to the firing voltage of said detonation-delay diode; a plurality of parallel-connected frequency-sensitive switch devices connected to said input terminal, each of said switch devices comprising a tuned circuit and an irreversible impulse-responsive switch, each tuned circuit being tuned to a different one of the signal frequencies capable of being applied to said first circuit point by said generator, said switch devices being so constructed and arranged that the momentary application of the predetermined combination of AC signal frequencies applied to said input terminal as said bomb falls away causes irreversible actuation of the impulse-responsive switches of those switch devices whose tuned

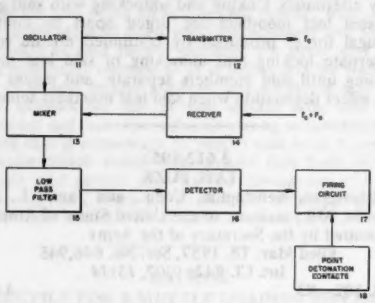
circuit is tuned to one of the signal frequencies present in the predetermined combination applied by said generator; said arming-delay resistance means and said detonation-delay resistance means each comprising a plurality of resistors, the resistors of said arming-delay resistance means being adapted to cooperate with a first number of said impulse-responsive switches so that the resistance provided by said arming-delay resistance means is determined by the number of said first number of impulse-responsive switches which are actuated, and the resistors of said detonation-delay resistance means being adapted to cooperate with a second number of impulse-responsive switches so that the resistance provided by said detonation-delay resistance means is determined by the number of said second number of impulse-responsive switches which are actuated, the arming-delay and detonation-delay-after-impact times, which are dependent on the resistances of said arming-delay resistance means and said detonation-delay resistance means, respectively, thus being selectively variable by choice of the predetermined combination of signal frequencies applied to said first circuit point by said generator.

3,613,590

VT FUSE WITH INHERENT CAPACITY FOR PD ACTION WHEN ON A NORMAL APPROACH COLLISION COURSE

Samuel W. Lichtman, Riverside, and Donald J. Adrian, Arlington, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy

Filed Feb. 15, 1956, Ser. No. 565,746
Int. Cl. F42c *13/04, 11/00, 13/00*
U.S. Cl. 102—70.2 P **2 Claims**



1. An ordnance fuze for an aerial missile comprising first circuit means for generating and transmitting a continuous wave radiofrequency signal into the surrounding spatial area, second circuit means for receiving a target reflected portion of said radiofrequency signal, third circuit means coupled to said first and second circuit means for developing an output signal having a frequency corresponding to the instantaneous frequency difference between said transmitted radiofrequency signal and said target reflected portion thereof, fuze firing means, fourth circuit means including a low pass filter and detector for effecting detonation of the fuze by said firing means only in response to said output signal when said output signal has a frequency indicative of a noncollision course by the missile, and impact responsive means for effecting detonation of the fuze by said firing means when the missile is on a target collision course.

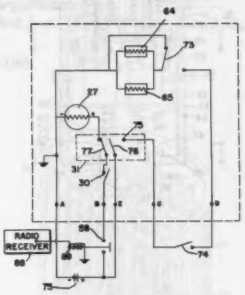
3,613,591

MISSILE-ARMING DEVICE

Donald R. Lenton, Philadelphia, Pa., assignor to The United States of America as represented by the Secretary of the Army

Filed Oct. 22, 1958, Ser. No. 769,043
Int. Cl. F42c *11/06, 15/24, 9/02*
U.S. Cl. 102—70.2 R **5 Claims**

1. A missile-arming device including a time delay mechanism having an output shaft, means for starting operation of said mechanism upon a predetermined acceleration of said device, a nose switch, first and second control switches, a power source, an electric motor, command switch means operable by a signal from a remote point to close a gap in a lead from said source, a first drum rotatable with said output shaft and having a pair of recesses, a second drum, a spring-biased pin operable upon its engagement with one of said recesses to release said second drum for rotation, means operable upon its engagement with the other of said recesses to close said first control switch



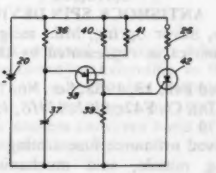
and complete a connection between said command switch and said motor, means coupling said second drum to said motor, said coupling means being operable upon a predetermined rotational movement of said motor to operate said second control switch for transferring a connection to said first control switch from said motor to one terminal of said nose switch, and a primer rotatable by said second drum and having one of its terminals connected to said source, said second drum having contacts rotatable to one position for short circuiting said primer and to another position for connecting said primer to the other terminal of said nose switch.

3,613,592

ELECTRONIC DELAY CARTRIDGE

William J. Brown, King George; Robert F. Butler, King George; Smith E. Hedden, Dahlgren, and Janis Jablovskis, King George, all of Va., assignors to The United States of America as represented by the Secretary of the Navy

Filed July 7, 1969, Ser. No. 840,603
Int. Cl. F42c *11/06, 15/40, 19/12*
U.S. Cl. 102—70.2 R **13 Claims**

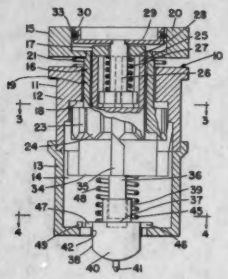


An extremely compact electronic cartridge for delaying the delivery of a firing pulse to a squib which initiates a main charge. The delay provided by the circuit is maintained constant with temperature variations by using a thermistor in the circuit, and the original firing pulse is provided by a thermal battery.

3,613,593
MECHANICAL COUNTING FUZE

Richard G. Thresher, 651 Jennifer Lane, Aberdeen, Md.; John P. Kosar, Apt. E6, Valley Stream Gardens, Denville, N.J., and James F. Harper, 400 Strafford Ave., Wayne, Pa.

Filed Mar. 30, 1965, Ser. No. 444,520
Int. Cl. F42c 7/02, 15/14, 15/24
U.S. Cl. 102—76 R 6 Claims



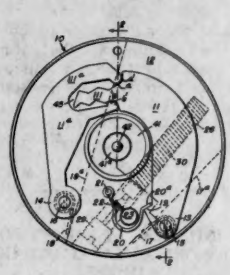
A fuze comprising a body with an upper and a lower end having a main axial bore therethrough, said body lower end having an axial bore smaller than said main bore and having radial groove means in the wall defining said smaller bore, a hollow outer plunger member slidably mounted in said main bore, an inner plunger member movably mounted in said outer plunger member and coaxial therethrough, a firing pin releasably secured to the lower end of said inner plunger member, cam means fixed on the end of said outer plunger member, cam follower means carried by said inner plunger member so constructed and arranged that upon relative downwardly directed axial movement of said outer plunger member with respect to said body the cam means will act on said follower means to impart a limited rotational movement to said inner plunger member, means preventing rotational movement of the outer plunger member with respect to said body, a resilient means operative between said firing pin and said inner plunger member, said resilient means arranged to oppose relative downwardly directed axial movement of said inner plunger member with respect to said body, tab means radially fixed on said firing pin and so arranged and constructed as to align with said groove means when said inner plunger member is rotationally advanced with respect to said outer plunger member by a predetermined number of axial reciprocations of said outer plunger member whereby said firing pin is freed to move downwardly under the force of said resilient means.

3,613,594
ANTISHOCK SPIN DEVICE

John F. Burke, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Army

Filed Feb. 13, 1958, Ser. No. 715,162
Int. Cl. F42c 9/02, 15/18, 15/04
U.S. Cl. 102—79 1 Claim

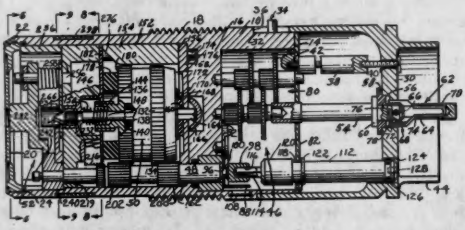
1. An improved ordnance fuze-arming mechanism for use on a spinning missile, said mechanism comprising in combination: a cylindrical fuze body having a flat circular face located in a plane perpendicular to the axis of missile rotation, first and second flat planar leaf members, each of said members having one of its ends pivotally connected to said face at spaced-apart points such that a flat side of each leaf member is movable around its pivot point parallel to said face, the other end of each leaf member extending adjacent the perimeter of said face and curving to engage each other at their outermost ends, the other end of the first leaf member having an elongated serrated blade portion, said blade portion having opposite edges with a series of adjacent grooves formed in each edge, the grooves on opposite edges being arranged so that the inner apexes of the grooves in one edge are opposite the outer apexes of the grooves in the other edge, the other end of said second leaf having an elongated opening therein for receiving said serrated blade portion, spring means connected to said fuze body and to the pivoted ends of said members so that said blade portion is urged into said opening, said opening having opposite inwardly projecting lips forming an entrance and adapted to engage said blade such that when one lip engages an inner apex on one edge, the other lip is opposite but just out of contact with an outer apex on the other edge, said lips thereby alternately locking and unlocking with said grooves when said leaf members are urged apart by continuous centrifugal forces produced by continued missile rotation, the alternate locking and unlocking of said leaf members continuing until said members separate, and means in said fuze to effect detonation when said leaf members separate.



3,613,595
TAIL FUZE

Evert Blomgren, Kensington, Conn., and James L. Baker, Bethesda, Md., assignor to the United States of America as represented by the Secretary of the Army

Filed Mar. 18, 1957, Ser. No. 646,945
Int. Cl. F42c 9/02, 15/34
U.S. Cl. 102—83 4 Claims



1. A tail fuze comprising in combination: a body having a nose end and a tail end, said body being adapted to fit into a fuze well; a cover at said nose end; a cap on said tail end; an air arming reduction gear cluster disposed in said body adjacent said tail end for transmitting a predetermined rate of angular rotation; a main setting shaft disposed in said body substantially parallel to the axis of said body and along a major portion thereof; a primary safety cam rotatably disposed in said body adjacent said tail end and coupled to said gear cluster and rotatable therewith, said safety cam engaging the end of said shaft disposed nearest said tail end

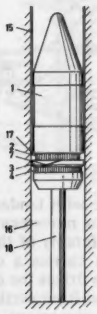
to maintain said shaft in a substantially fixed position, said safety cam adapted to longitudinally displace said shaft from said fixed position to a first position upon rotation of said gear cluster for a predetermined time interval, said shaft at said first position being free so as to be longitudinally displaced to a second position when said fuze body impacts on said nose end; a preset timer disposed axially of said fuze body and intermediate said nose and tail ends; gear means operably connecting said timer to said shaft, said gear means locking said timer against movement during said fixed and first positions and releasing said timer at said second position; a rotatable timing cam coupled with said timer and rotatable upon rotational movement of said timer, said timing cam having a slot in its periphery; a stop mounted on the nose end of said main setting shaft and disposed within said body; a spring-biased stab firing pin axially disposed adjacent said nose end; a spring-biased rotatable release lever having bifurcated first and second arms, the end of the first arm contacting the periphery of said timing cam; a spring-biased rotor mounted for rotation adjacent said nose end; a detonator in said rotor, the second arm of said lever blocking axial movement of said firing pin towards said rotor, said stop engaging said rotor during said fixed and first positions to lock said detonator out-of-line with said firing pin, said stop moving from engagement with said rotor at said second position so that said detonator is aligned with said firing pin, said stop also locking and unlocking said timing cam during said first and second positions, respectively, said timing cam after being unlocked rotating until the end of said first arm enters said slot, said second arm then being moved by the spring-bias acting on said lever so as to unblock said firing pin, said firing pin thereby being free to strike said detonator and initiate detonation of said fuze; a rotatable tamper release cam positioned in said nose end, said release cam being biased from locking contact with said stop, on end of said release cam being locked against rotative movement by said stop during said fixed and first positions and unlocked for rotation at said second position, the other end of said release cam being serrated so as to firmly grip the wall of said fuze well at said second position; and means on said release cam to contact the end of said second arm; said tamper release cam and said means thereon being so constructed and arranged that if subsequent to impact said body is rotated in a direction which would remove said fuze body from said fuze well, said second arm will be moved out of blocking position with said firing pin so that said firing pin can strike said detonator and initiate detonation of said fuze.

3,613,596

PROJECTILE FOR A MUZZLE LOADING RIFLE-BORE MORTAR

Erik Walde, Eskilstuna, Sweden, assignor to Forsvarets Fabriksverk, Eskilstuna, Sweden

Filed Apr. 30, 1969, Ser. No. 820,567
Int. Cl. F42b *31/00, 13/22*
U.S. Cl. 102—94 **5 Claims**



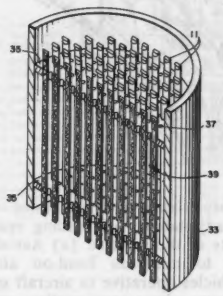
A projectile for a muzzle loading rifle-bore mortar, with the projectile having an annular, circumferential groove provided with a rifled surface; an angularly split ring is located in the groove and is of less width than the groove so that the ring can move within the groove. The ring has resiliency sufficient to permit it to expand to a diameter similar to the diameter of a rearward nonrifled area of the mortar barrel and the said nonrifled part of the barrel has a diameter similar to that of the bases of the rifling. The depth of the groove increases steadily from the rearmost to the foremost of its flank surfaces.

3,613,597

SOLID PROPELLANT GRAIN

Francis A. Warren, Waco, and Sylvester C. Britton, McGregor, both of Tex., assignors to North American Rockwell Corporation

Filed Jan. 16, 1964, Ser. No. 338,260
Int. Cl. F42b *9/14*
U.S. Cl. 102—100 **2 Claims**



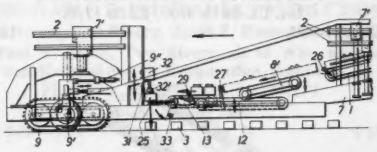
A solid propellant grain including a binder matrix containing circumferentially disposed, elongated, hollow strands of filaments filled with reactive combustible material.

3,613,598

MOBILE APPARATUS FOR LAYING TRACK TIES

Franz Plasser, and Josef Theurer, both of Johannesqasse 3, 1010 Vienna, Austria

Filed Oct. 7, 1969, Ser. No. 864,373
Claims priority, application Austria, Oct. 16, 1968, 10088/68
Int. Cl. E01b *29/06;* **B65g** *47/30*
U.S. Cl. 104—6 **10 Claims**



In a mobile track renewal apparatus which includes an elongated track tie conveyor extending in the direction of track elongation and a turntable associated with the elongated conveyor for turning a tie 90°, the turntable includes a coplanar endless conveyor band in selective alignment with the elongated conveyor and a position transverse thereto.

3,613,599

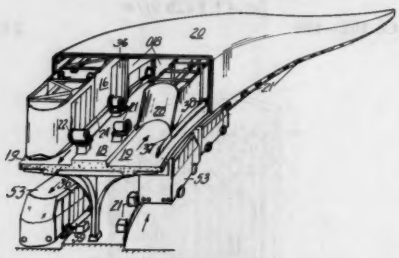
GROUND TRANSPORATION SYSTEMS

Solomon H. Seidman, 2021 Meridian Ave., Miami Beach, Fla.

Filed June 21, 1968, Ser. No. 739,122
Int. Cl. B61b *13/10, 13/12*
U.S. Cl. 104—18 **11 Claims**

Systems of high-efficiency, continuous, electric-powered transportation for urban areas comprise a plurality of the following systems in various combinations:

(a) Dependable, continuous transportation is attainable by ever-accessible, external systems of continuous propulsion of individual and multisection vehicles by imparting successive impulses thereto. (b) The propulsion systems and three-dimensional guiding systems include resiliently yielding components of downward-directed pressure, serving to maintain positive, adequate traction between the driving-guiding systems and the tractional surfaces on successive vehicles for their propulsion at widely ranging operative speeds including speeds designed to propel vehicles buoyantly above ground. (c) Automatic timing systems operative to maintain the successive vehicles on headway time measurable in seconds, serve to provide ever-ready availability of transport. (d) Continuous loading systems include continuous, speed-adjusting load transfer systems in



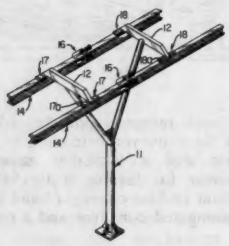
temporarily unitary relation with successive vehicles on short headway time, adjustability of loading speed establishing transport capacity of the systems. (e) Aerodynamic control systems serving to minimize head-on air resistance to movement of vehicles operative to aircraft speeds, comprise all-weather inclosure whose cross section varies inversely to vehicle speed change and embodies air passage for eliminating differential of pressure between air masses between vehicles. (f) All-electric automobile transport in a wide range of highway speeds and distances beyond storec power capability of electric automotive vehicles, is attainable in combination with the external, electric propulsion systems as in (a) and electric generator in each vehicle restoring the automotive power capacity while powered from vehicle propelled externally.

3,613,600

RAIL EXPANSION JOINT

Frank P. Pettit, Arvada, Colo., assignor to Projects General of America, Denver, Colo.

Filed Mar. 3, 1969, Ser. No. 803,636
Int. Cl. B61b *3/00*; E01b *11/00*
U.S. Cl. 104—91 **10 Claims**



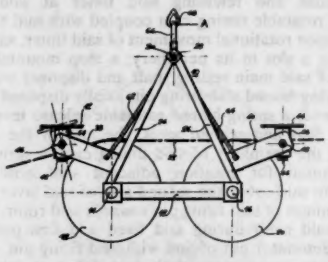
In a rail-type carrier system, the ends of the vehicle-carrying rail sections are supported by towers, and an expansion joint cooperates with the towers to support adjacent ends of the rail sections in a way so as to resist compression loading in the upper portion of each rail section resulting from the downward bending of the rail section under the weight of a vehicle while permitting normal expansion and contraction. The expansion joint is also constructed and arranged to prevent misalignment of the ends of the rail sections during vehicle movement therealong.

3,613,601

SUPPORT DEVICE FOR AERIAL CABLE

Jean Pomagalski, 114 Avenue de l'Eygale, 38 La Tranche', France

Filed Nov. 27, 1968, Ser. No. 779,438
Claims priority, application France, Dec. 29, 1967, 5208
Int. Cl. B61b *7/10*
U.S. Cl. 104—197 **4 Claims**



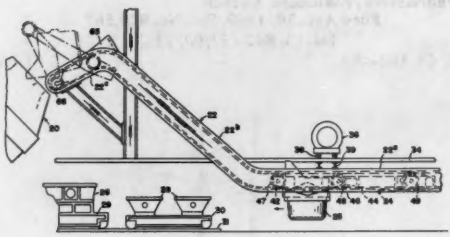
This disclosure concerns a device for supporting and guiding an aerial cable to which is imparted a longitudinal movement for the conveying of loads made fast on the cable, and including a chassis on which are pivoted to support the cable at least two rotatable rollers having substantially parallel rotational axes, the chassis being connected to a fixed element such as a tower. The device has two members positioned respectively at the entrance and the exit of the supporting device and preventing the cable from disengaging from the rolling surface of the rollers. The movable cable bears laterally against the members due to the spatial arrangement of the hooking point of the chassis to the fixed element relative to the active surfaces of these limiting members.

3,613,602

ARTICULATED CARRIAGE TILTING DUMPING VEHICLE

Klaus W. Forster, Brecksville, and Donald W. Schaper, Alliance, both of Ohio, assignors to Kerma Corporation, Alliance, Ohio

Division of Ser. No. 671,784, Sept. 29, 1967, Pat. No. 3,497,089
Filed June 5, 1969, Ser. No. 847,766
Int. Cl. B61d *3/10*, *7/12*, *9/14*
U.S. Cl. 105—261 A **3 Claims**



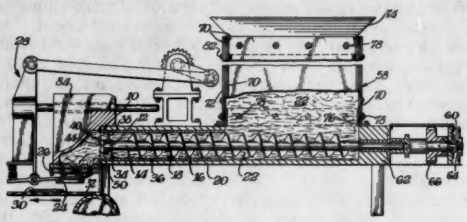
An articulated carriage with tandem sections is supported and guided by a track for movement to a location above a steelmaking furnace, preferably of the basic oxygen type. A forward carriage section carries a charge container and a following carriage section drives the carriage along the track. Forward movement of the front section is stopped above the furnace and continued movement of the trailing section jackknifes the carriage, tilting the front section and charge container forward. A portion of the track above the furnace is angularly inclined downwardly relative to a preceding portion of the track to initiate tilting of the front section of the carriage.

3,613,603

DETACHABLE BEARING FOR EXTRUDER

Howard Reisman, Moorestown, N.J., assignor to Bakery Specialty Machinery Co., Moorestown, N.J.

Filed May 21, 1970, Ser. No. 39,437
Int. Cl. A21c 11/16
U.S. Cl. 107—14 C 4 Claims



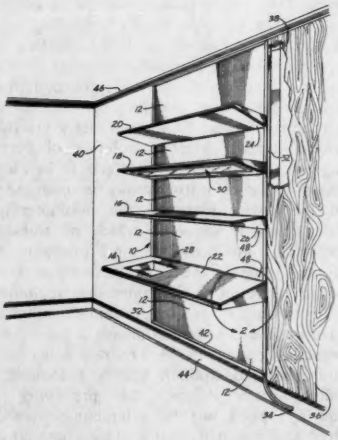
A cylindrical bearing in a hub is supported within and near the exit from an extrusion channel by a spider loosely engaged within recessed pockets in the wall of the extrusion channel. The legs of the spider are inserted or removed through entrance slots in the end of the channel which connect with the sides of the recesses. This allows the blind portions of the recesses adjacent the exit end of the wall to provide pockets for retaining the legs. The propelled doughy mass fills in the spaces between the legs and the pockets within which they are inserted and forces the spider into firm contact with the recesses to securely lock them in place and firmly support the bearing. The slotted recesses may be conveniently provided within a wear-resistant sleeve which forms the wall of the channel. The bearing element utilizes a food grade lubricant when dough for baking products, such as pretzel is extruded.

3,613,604

DISPLAY UNIT HAVING INTEGRATED CANTILEVER SHELVES

Ronald J. Butler, 223 Cabrillo Ave., Venice, Calif.

Filed Oct. 30, 1969, Ser. No. 872,553
Int. Cl. A47b 23/04, 55/00
U.S. Cl. 108—42 5 Claims



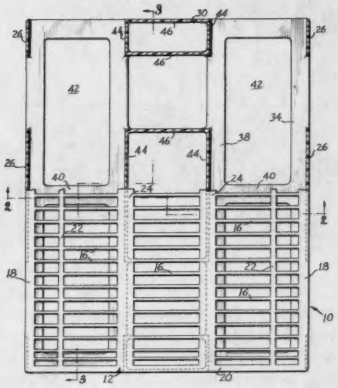
A display unit having substantially hollow cantilever shelves which are an integral part of a decorative support surface is provided for mounting to a vertically disposed structure such as a wall or studs.

3,613,605

FOUR-WAY, DOUBLE-FACE GENERAL PURPOSE PALLET

Ernest C. Holdredge, Jr., Decatur, Ga., assignor to Allastics, Inc., Norcross, Ga.

Filed Feb. 1, 1970, Ser. No. 12,812
Int. Cl. B65d 19/18
U.S. Cl. 108—58 9 Claims



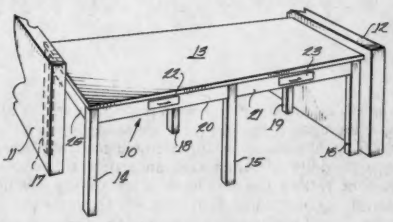
A four-way, double-face general purpose pallet having sidewalls which are sufficiently thin so that they are not capable of and in fact do not offer a practical resisting moment to the termination of a top deck member by virtue of the walls' thickness. The resisting moment is provided by joining opposed sidewalls together through a series of tensile bottom deck members. The pallet is preferably prepared in a single, integral structural form from a foamed plastic material. Internal, structural supports provide inflexible areas for static support so that multiple loaded or unloaded pallets may be stacked upon one another.

3,613,606

ADJUSTABLE TABLE FRAME CONSTRUCTION

Harry N. Grow, Two Rivers; David F. Huempfner, Kewaunee, and Paul A. Reich, Two Rivers, all of Wis., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Feb. 27, 1970, Ser. No. 15,179
Int. Cl. A47b 3/06
U.S. Cl. 108—153 7 Claims



A metal table frame construction is provided which may be adjusted by cutting to vary the spacing between supporting legs or between a leg and a sidewall so that the frame will fit flush in a recess or against an adjacent wall, case, sink, etc.

The adjustment is easily accomplished on site, and the cut can be made at any location within the continuous adjustment range.

3,613,607

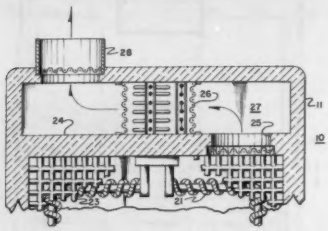
INCINERATOR OR SIMILAR ARTICLE

Edward W. Hacker, 3 South William St., Kennewick, Wash.

Filed Feb. 2, 1970, Ser. No. 7,474

Int. Cl. F23g 5/10

U.S. Cl. 110—18 E **5 Claims**



The incinerator of this invention includes an insulated box having heating means operable to cause combustible products deposited therein to be burned. A grid is provided over the heat means to increase burning of the combustible product. Venting exitways having air filters are provided in the housing to retain exhaust air contaminants. The incinerator is operable to destroy by burning a single combustible product at a time deposited therein.

3,613,608

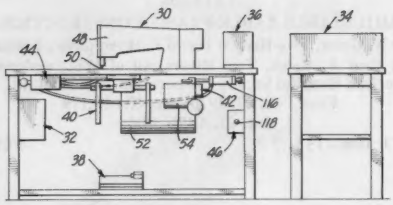
CONTROL EQUIPMENT FOR MANUFACTURING EQUIPMENT SUCH AS SEWING EQUIPMENT AND THE LIKE

Norman M. Hinerfeld, Mamaroneck, N.Y.; David S. Nobler, Carpinteria, and William H. Bartley, Orange, Calif., assignors to Kayser-Roth Corporation, New York, N.Y.

Filed May 23, 1969, Ser. No. 827,293

Int. Cl. D05b 23/00

U.S. Cl. 112—2 **42 Claims**



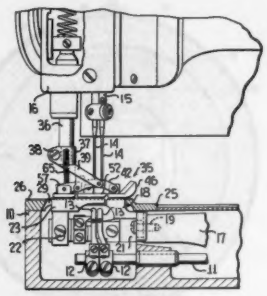
The manufacturing equipment is preferably in the form of sewing equipment comprised of a usual sewing head with a reciprocal up and down moving needle electrically driven for sewing a plurality of stitches in an article to be sewn. A presser foot retains the article in place during sewing and downwardly against usual feed dogs which move the article forwardly and rearwardly appropriate for the various stitching operations. A needle positioner is operable with the sewing with the sewing head for positioning the needle in a selected up or down position relative to the article at the termination of any sewing operational step, the needle preferably being positioned down extending through the article between at least certain successive sewing steps so that the article may be manually repositioned by an operator between said steps. A thread cutoff component is operably arranged with the sewing head for cutting off thread used by the needle in stitching at the termination of selected sewing steps, the thread cutoff being operable when the needle is up above the article as positioned by the needle positioner. According to the invention, the needle positioner also includes a counter device automatically counting reciprocations of the needle and capable of transmitting an electrical signal equivalent to such movement count. The sewing equipment may be controlled by the usual manually operable switches such as knee control and foot control switches. The equipment likewise may include usual components such as an automatic pickup for supplying articles to the operator and an automatic stacker for removing sewn articles from the operator, and the sewing head may make use of usual attachments such as pleater and buttonhole attachments. Further, according to the invention, an automatic controller, a power interface and preferably an automatic recorder are electrically connected with the sewing equipment, and a permanent record command switch is preferably arranged with the foot control switch. The power interface serves to electrically integrate the manually operable switches and the automatic controller with the sewing equipment, said power interface being selectively switchable between a manual mode and an automatic mode. In manual mode, the power interface connects the manually operable switches for usual control of the sewing equipment to perform a plurality of operational steps in an overall sewing operation on the article to be sewn, while at the same time, the power interface translates each of the component operational steps into composite instruction signals for transmission to and temporary recording at the automatic controller, any selected of said composite instruction signals being permanently recorded by the automatic controller in sequence by actuation of the permanent record command switch. Each instruction signal includes both function, the component being operated, and duration, either pure time in time elements or needle reciprocations from the needle positioner and counter. The automatic recorder is connected to the automatic controller and is selectively actionable for inserting in proper sequence into temporary and permanent recording of the automatic controller composite instruction signals equivalent to certain of the composite instruction signals resulting from actual operation of the sewing equipment so that selected of the sewing equipment operations either need not be carried out by manual control or may be replaced by the automatic recorder. Also, the automatic controller is arranged for inserting instruction signals for determined time delays between selected component operations, either by permanently recording actual delays between component operations or by inserting numbers of time elements with the automatic recorder. Instructions for indeterminate time delays between component operations and training time delays intermediate selected component operations may likewise be appropriately inserted into the automatic controller. After completion of the permanent recording, when the power interface is in the automatic mode, the automatic controller may be operated to transmit back to the power interface the permanently recorded instruction signals in sequence which are translated by the power interface into commands for operating the various components to repeat the component operational steps to carry out the overall sewing operation including the now inserted determined delays, indeterminate delays and training delays. During the determined delays, a preceding operating component is stopped, the determined delay carried out in time, and a latter component started automatically. During the indeterminate delays, the preceding component operation is stopped, but the latter component operation is not started until manually actuated by a manual control. The training delays are indeterminate and may be intermediate a selected component operation interrupting such operation until manual control actuation or between component operations as an ordinary indeterminate delay, in either case, there being means on the automatic controller for selected elimination of the training delays with the effect of removal from the automatic controller permanent recording.

3,613,609

FEED MECHANISM AND PRESSER FOOT ARRANGEMENT

Robert A. Hayes, Franklin Park, and James A. Frendreis, Chicago, both of Ill., assignors to Union Special Machine Company, Chicago, Ill.

Filed Sept. 15, 1969, Ser. No. 857,929
Int. Cl. D05b 27/02, 29/00
U.S. Cl. 112—235 17 Claims



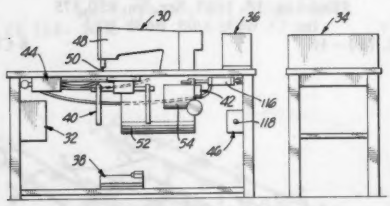
A multiple needle felling machine including a main feed bar and a differential feed bar connected, respectively, to a main feed dog and a differential feed dog each having several rows of teeth with one row being higher than the other rows and the teeth on the respective feed dogs facing in opposite directions. A multiple-section presser foot cooperates with the feed dogs and includes a spring-loaded yielding section to clamp the thread chain to insure nonskipping at the start of sewing operations.

3,613,610

METHODS OF AUTOMATICALLY CONTROLLING MANUFACTURING OPERATIONS SUCH AS SEWING OPERATIONS AND THE LIKE

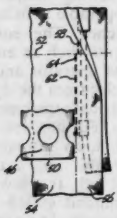
Norman M. Hinerfeld, Marmaroneck, N.Y.; David S. Noble, Carpinteria, Calif., and William H. Bartley, Orange, Calif., assignors to Kayser-Roth Corporation, New York, N.Y.

Filed May 23, 1969, Ser. No. 827,369
Int. Cl. D05b 1/00
U.S. Cl. 112—262 41 Claims



The manufacturing operations involve equipment preferably in the form of sewing equipment comprised of a usual sewing head with a reciprocal up and down moving needle electrically driven for sewing a plurality of stitches in an article to be sewn. A presser foot retains the article in place during sewing and downwardly against usual feed dogs which move the article forwardly and rearwardly appropriate for the various stitching operations. A needle positioner is operable with the sewing head for positioning the needle in a selected up or down position relative to the article at the termination of any sewing operational step, the needle preferably being positioned down extending through the article between at least certain successive sewing steps so that the article may be manually repositioned by an operator between said steps. A thread cutoff component is operably arranged with the sewing head for cutting off thread used by the needle in stitching at the termination of selected sewing steps, the thread cutoff being operable when the needle is up above the article as positioned by the needle positioner. Required for certain of the methods of the invention, the needle positioner also includes a counter device automatically counting reciprocations of the needle and capable of transmitting an electrical signal equivalent to such movement count. The sewing equipment may be controlled by the usual manually operable switches such as knee control and foot control switches. The equipment likewise may include usual components such as an automatic pickup for supplying articles to the operator and an automatic stacker for removing sewn articles from the operator, and the sewing head may make use of usual attachments such as pleater and buttonhole attachments. Further, required for certain of the methods of the invention, an automatic controller, a power interface and preferably an automatic recorder are electrically connected with the sewing equipment, and a permanent record command switch is preferably arranged with the foot control switch. The power interface serves to electrically integrate the manually operable switches and the automatic controller with the sewing equipment, said power interface being selectively switchable between a manual mode and an automatic mode. In manual mode, the power interface connects the manually operable switches for usual control of the sewing equipment to perform a plurality of operational steps in an overall sewing operation as the article to be sewn, while at the same time, the power interface translates each of the component operational steps into composite instruction signals for transmission to and temporary recording at the automatic controller, any selected of said composite instruction signals being permanently recorded by the automatic controller in sequence by actuation of the permanent record command switch. Each instruction signal includes both function, the component being operated, and duration, either pure time in time elements or needle reciprocations from the needle positioner and counter. The automatic recorder is connected to the automatic controller and is selectively actionable for inserting in proper sequence into temporary and permanent recording of the automatic controller composite instruction signals equivalent to certain of the composite instruction signals resulting from actual operation of the sewing equipment so that selected of the sewing equipment operations either need nor be replaced by the automatic recorder. Also, the automatic controller is arranged for inserting instruction signals for determined time delays between selected component operations, either by permanently recording actual delays between component operations or by inserting numbers of time elements with the automatic recorder. Instructions for indeterminate time delays between component operations and training time delays intermediate selected component operations may likewise be appropriately inserted into the automatic controller. After completion of the permanent recording, when the power interface is in the automatic mode, the automatic controller may be operated to transmit back to the power interface the permanently recorded instruction signals in sequence which are translated by the power interface into commands for operating the various components to repeat the component operational steps to carry out the overall sewing operation method including the now inserted determined delays, indeterminate delays and training delays. During the determined delays, a preceding operating component is stopped, the determined delay carried out in time, and a latter component started automatically. During the indeterminate delays, the preceding component operation is stopped, but the latter component operation is not started until manually actuated by a manual control. The training delays are indeterminate and may be intermediate a selected component operation interrupting such operation until manual control actuation or between component operations as an ordinary indeterminate delay, in either case, there being means on the automatic controller for selected elimination of the training delays with the effect of removal from the automatic controller permanent recording.

3,613,611
INSTALLATION OF SEAM-TYPE ZIPPERS
Robert B. Howell, 2115 Madrona Blvd., Bremerton, Wash.
Division of Ser. No. 768,466, Oct. 17, 1968
Filed Apr. 22, 1970, Ser. No. 30,706
Int. Cl. A44b 19/00
U.S. Cl. 112—265 6 Claims



An extension of lipped channel form extends endwise of the straight channel end portion of the slider of a seam-type zipper and is attached to the slider proper by means of a plurality of splice strips separated from each other by serrations. A pliershke tool is used to both sever the extension from the slider and to crimp it into certain of the fastener elements, to thereafter serve as a stop member for the slider.

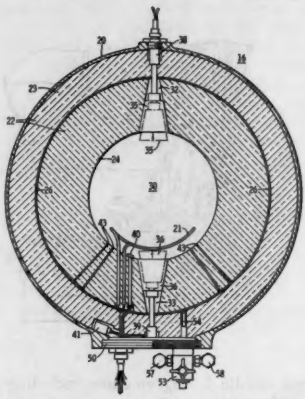
3,613,612
HIGH-STRENGTH TUFTED PILE FABRIC
Carroll Trowbridge Kennedy, Waynesboro, Va., assignor to Thiokol Chemical Corporation, Bristol, Pa.
Filed May 5, 1965, Ser. No. 453,478
Int. Cl. D05c 17/02
U.S. Cl. 112—410 2 Claims

The invention relates to a high-strength tufted pile fabric having a woven primary backing material of polypropylene or copolymer of propylene yarn, at least some of the yarn having a relatively flat cross section, which has been coated with about 0.2 to 12 percent, based on the weight of the yarn, of a lubricant material prior to penetrating tufts through the bodies of the yarn. The presence of the lubricant material on the yarns of the backing enhances penetration of the tufting needles and tufts into the yarns without the tufting needles causing the otherwise serious rupturing and shattering of the penetrated yarns which occurs during tufting of otherwise similar, but unlubricated, woven primary backing.

3,613,613
CLOSURE MEMBER COATING COMPOSITION COMPRISING AN ORGANOSOL-SOLUTION OF POLYVINYL CHLORIDE, ACRYLONITRILE-BUTADIENE COPOLYMER, AND PHENOLIC RESOLE RESIN
Edward F. Loritz, Chicago, and Harold W. Unger, Mount Prospect, both of Ill., assignors to Continental Can Company, Inc., New York, N.Y.
Filed July 29, 1959, Ser. No. 830,200
Int. Cl. B21d 51/46
U.S. Cl. 113—80 DA 17 Claims

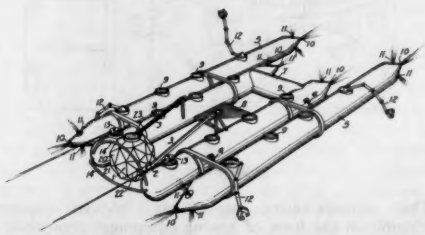
1. A three-component resin coating composition for coating closure members, comprising polyvinyl chloride resin, solvated acrylonitrile-butadiene copolymer, a solvated phenolic resole resin, and solvents for said acrylonitrile-butadiene copolymer and phenolic resole resin, said polyvinyl chloride resin being dispersed with the solvated components to form a combination organosol-solution.

3,613,614
FLOTATION APPARATUS
Emerick T. Polgar, Vancouver, British Columbia, Canada, assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Mar. 16, 1970, Ser. No. 19,653
Int. Cl. B63g 8/00
U.S. Cl. 114—16 E 8 Claims



A spherical pressure vessel, to add buoyancy to a submersible vehicle, is designed to withstand a fraction of the maximum ambient sea pressure to be encountered. The sphere is filled with a pressurized gas and as the vehicle descends the gas is heated to increase its pressure in proportion to the absolute temperature. As the submersible ascends, the gas is cooled to decrease its pressure. Lining the inside of the sphere is an insulating means defining a central gas-filled core and having a cooling passage therein which is communicatable with the core by means of solenoid-operated plugs to effect cooling. The heating and cooling of the gas are monitored by means of instrumentation and so controlled that the difference between the internal gas pressure and the external pressure of the ambient sea is always within a broad safe range.

3,613,615
MANNED, MOBILE SUBMERSIBLE
Rolland G. Sturm, 1320 Forbes Drive, Huntsville, Ala., and John M. Coon, Rte. #2, Petersburg, Tenn.
Filed Aug. 15, 1969, Ser. No. 850,375
Int. Cl. B63g 8/00; B63h 5/12
U.S. Cl. 114—16 6 Claims



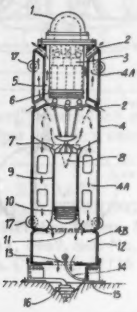
The present invention relates to a Geophysical Exploratory Manned, Mobile Submersible (GEMMS) craft, comprised of a polyhedral transparent personnel command unit supported by a quadritubular hull. The command unit is movable along ramps from a retracted to an extended position. The command unit is constructed of a plurality of triangular flat segments of transparent material arranged so that the vertices of all segments lie on a circumscribing sphere.

3,613,616

METHOD AND MEANS PROVIDING BUOYANCY OF IMMERSED CRAFTS AND CRAFTS INCORPORATING SUCH MEANS

James Basset, Brauais par Proue, Eure-&-Loir, France

Filed July 25, 1969, Ser. No. 844,791
Claims priority, application France, Apr. 25, 1969, June 19, 1969, 6913192;6920629
Int. Cl. B63g 8/24; B63c 7/00
U.S. Cl. 114—16.5 1 Claim



A buoy adapted to aid in the location of a submerged craft comprising an open-bottomed normally flooded buoyancy chamber, a case enclosed in said chamber containing a gas-producing substance used to displace the water in said chamber upon release, and another casing also enclosed in said chamber containing a signal transmitter. Both of said casings are partially expansable to permit a balance of fluid pressures to prevent crushing the buoy at extreme ocean depths.

ERRATUM

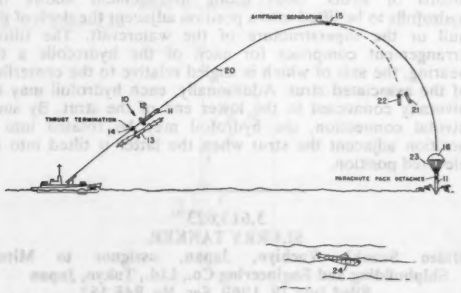
For Class 114—16R see:
Patent No. 3,613,640

3,613,617

ROCKET-THROWN WEAPON

Miles H. Hamilton, Pasadena, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed Mar. 17, 1960, Ser. No. 15,769
Int. Cl. F42b 15/22, 17/00, 19/00
U.S. Cl. 114—20 R 6 Claims



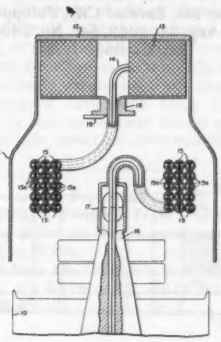
A missile for use against a target submarine, comprising, in combination: a forward section including a payload apparatus for delivery to a suspect water area; a rocket motor stationed rearwardly of said forward section and in axial alignment therewith, to provide a thrust phase of missile flight; said rocket motor comprising a nozzle structure at its aft extremity to direct rocket motor pressurized propellant gases rearwardly, and further having a port at its forward extremity; a bulkhead structure stationed immediately forward of said rocket motor and in obturating relationship to said port; releasable fastening means securing said rocket motor to said forward section and maintaining said port-obturating relationship; said port having an orifice area greater than the effective orifice area of said nozzle structure; said rocket motor thereby being continuously subjected, during generation of pressurized propellant gases, to a net force tending to separate it from said airframe and bulkhead structure; said rocket motor having a characteristic maximum period of thrust generation; and means for releasing said fastening means, whereby to separate and jettison said rocket motor and correspondingly terminate said thrust phase of missile flight, predeterminately during missile flight and prior to expiration of said characteristic maximum period.

3,613,618

PROTECTIVE SHEATH FOR TORPEDO CONTROL WIRE

Ernst Gruber, Eckernforde, Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Dec. 2, 1965, Ser. No. 512,230
Int. Cl. F41f 3/10, 3/08; F41g 7/04
U.S. Cl. 114—21 R 3 Claims

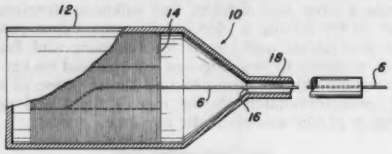


A protective arrangement for a control wire extending between a torpedo and a torpedo tube aboard a boat. The arrangement comprises a sheath through which the control wire extends, the length of this sheath being less than the range of the torpedo and equal to the distance from the boat through which the control wire is to be protected. One end of the sheath is secured to the torpedo tube, there being a rupturable connection for securing the other end of the sheath to the torpedo. Consequently, the torpedo, after reaching the above-mentioned distance from the boat, will tear itself free from the sheath. In this way, the control wire is protected near the boat, which is where such protection is needed, without it being necessary to store excessively large amounts of protective sheathing on the boat.

3,613,619
PAYOUT COIL IMPREGNATED WITH CONDUCTIVE ADHESIVE

Richard W. de Nobel, Silver Spring; Donald G. Schurman, Rockville; Theodore J. Lindstadt, Jr., Oleny, and Hans A. Koenig, Rockville, all of Md., assignors to The United States of America as represented by the Secretary of the Navy

Filed Dec. 5, 1969, Ser. No. 882,794
Int. Cl. F42b *19/06*
U.S. Cl. 114—21 7 Claims

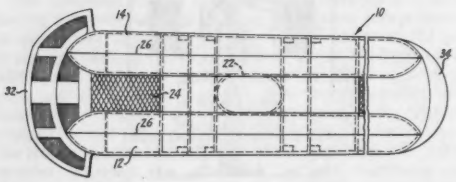


A wire-guided torpedo payout coil including a container which has an exit opening; a coil of insulated wire disposed within the container with a portion of the wire extending through the exit opening; and the voids within the coil of wire being filled with a conductive adhesive, such as an adhesive mixture of silicone fluid and graphite, such as carbon black.

3,613,620
SAFETY HULL FOR WATERCRAFT

Nicomedes S. Generoso, Bacolod City, Philippines

Filed Aug. 11, 1969, Ser. No. 848,786
Int. Cl. B63b *1/10*
U.S. Cl. 114—61 1 Claim

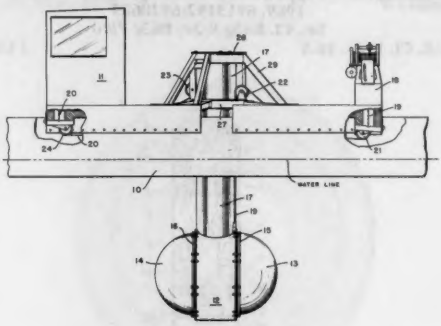


A safety hull for watercraft in which a catamaran-type hull provides improved stability during all types of sea, minimizes friction contact with the water to afford maximum speed and efficiency, in which the twin hulls include compartmentalized walls to prevent sinking, and in which forward and aft resilient bumpers protect the hull during collision, and also protect the hull while anchored in a harbor or moored at a pier.

3,613,621
OCEANOGRAPHIC OBSERVATION PLATFORM

Larry E. McKinley, and William E. Evans, both of Escondido, Calif., assignors to The United States of America as represented by the Secretary of the Navy

Filed Sept. 23, 1969, Ser. No. 860,344
Int. Cl. B63b *35/00*
U.S. Cl. 114—66 1 Claim

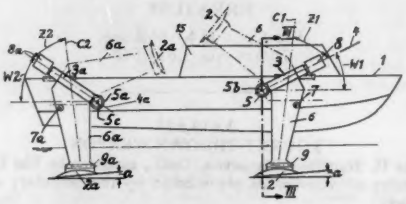


An underwater viewing vehicle comprising a viewing compartment fixedly attached to a vertical entry tube, a winch for raising and lowering the viewing compartment and all carried on a catamaran.

3,613,622
TILTABLE HYDROFOIL ARRANGEMENT

Karl Bueller, Lucerne, Switzerland, assignor to Supramar AG, Lucerne, Switzerland

Filed Mar. 16, 1970, Ser. No. 19,787
Int. Cl. B63b *1/18*
U.S. Cl. 114—66.5 H 6 Claims



A tilting arrangement is disclosed for watercraft having a pair of hydrofoils mounted on opposite sides of the hull by means of struts. Such tilting arrangement allows the hydrofoils to be lifted into a position adjacent the deck of the hull or the superstructure of the watercraft. The tilting arrangement comprises for each of the hydrofoils a tilt bearing, the axis of which is angled relative to the centerline of the associated strut. Additionally, each hydrofoil may be pivotally connected to the lower end of the strut. By such pivotal connection, the hydrofoil may be rotated into a position adjacent the strut when the latter is tilted into its elevated position.

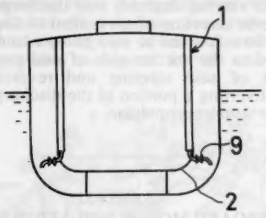
3,613,623
SLURRY TANKER

Hideo Suzuki, Yachiyo, Japan, assignor to Mitsui Shipbuilding and Engineering Co., Ltd., Tokyo, Japan

Filed July 28, 1969, Ser. No. 845,162
Claims priority, application Japan, Aug. 5, 1968, 43/55424
Int. Cl. B63b *25/02*
U.S. Cl. 114—73 1 Claim

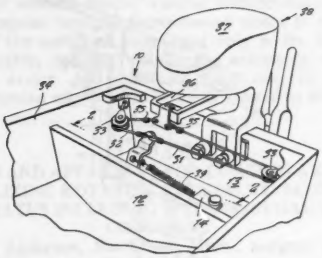
A cargo vessel for handling materials received in the form of a slurry. The cargo tank of the vessel is provided with a dewatering device comprising a series of upstanding conduits

having filtering means along the entire height of the wall of the tank to discharge the water from the slurry into the



ballast tanks of the vessel, from which it may be discharged by the conventional ballast pumps, if desired.

3,613,624
ELECTRIC BOAT-STEERING SYSTEM
John G. Stauffer, 922 River Ave., Alma, Mich.
Filed Sept. 11, 1969, Ser. No. 857,002
Int. Cl. B63h *21/26*
U.S. Cl. 114—144 **2 Claims**

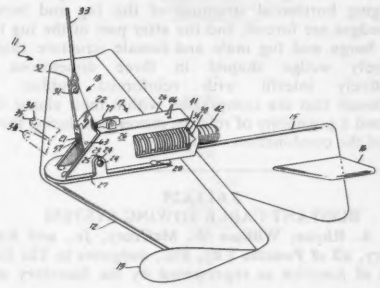


A boat-steering system which includes a remote control, a two-way switch in an electrical circuit with a through pole motor for driving a gear train for selectively pivoting a tiller toward a right or left, the tiller arm being connected by cable to opposite sides of a steering arm of an outboard motor.

3,613,625
MEANS FOR KEEPING THE POSITION OF A SHIP CONSTANT DURING MOORING
Per Rudelius, Halsingborg, and Ake Sallow, Vasteras, both of Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden
Filed Mar. 18, 1970, Ser. No. 20,540
Int. Cl. B63b *21/00*
U.S. Cl. 114—230 **5 Claims**

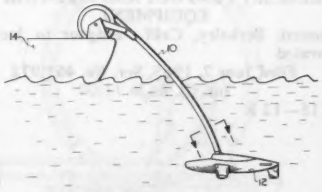
In order to keep a ship in constant position when moored at a quay, one or more mooring winches are mounted fore and aft of the ship and connected to fixed points on the quay. A pillar on the quay is engaged by a forked rod pivoted at the side of the ship. Pivoting of this rod by any movement of the ship operates a control device which sets one or the other of the winch motors in operation so as to restore the ship in its original position.

3,613,626
REMOTE OPERATED LIFT CONTROL DEVICE
Raymond E. Kelly, and Edward W. Johnson, both of Panama City, Fla.
Filed Mar. 20, 1970, Ser. No. 21,240
Int. Cl. B63b *21/56*
U.S. Cl. 114—235 **16 Claims**



A hydrodynamic diverter is disclosed as including a lift surface and a shiftable tow mechanism attached thereto that enables said lift surface to be towed from at least two different latched attitude controlled positions which, in turn, respectively vary the angle of attack thereof, as it is being towed through water or other appropriate aqueous or fluid medium. Shifting of the tow mechanism from one position to the other–in either direction–is accomplished by successively reducing and increasing the towing force applied thereto in a predetermined manner, and such force changes may be effected directly by any convenient means or remotely by a tow cable, control link, servo, or other suitable means.

3,613,627
HIGH SPEED FAIRED TOWING CABLE
Paul B. Kennedy, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.
Filed June 15, 1970, Ser. No. 46,189
Int. Cl. B63b *21/00*; H01b *7/12*
U.S. Cl. 114—235 F **8 Claims**

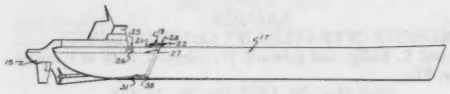


A low-drag underwater towing cable having a high stability at high towing speeds. The cable comprises an elongated hydrofoil-shaped structure with a leading edge made from continuous unidirectional glass fibers bonded together and a trailing edge made from flexible material such as plastic, rubber, or the like. An elastomer impregnated cross-woven material covers and encloses the leading and trailing edge portions. Braided electrical conductors are led through the trailing edge at a predetermined location nearest the leading edge for preventing tension forces and for avoiding interference with trailing edge yielding properties.

3,613,628
APPARATUS AND METHOD OF JOINING TUG AND BARGE IN OCEAN PUSH-TOWING

Emilio C. Garcia, 441 Gravier St., New Orleans, La.

Filed Dec. 18, 1969, Ser. No. 886,331
Int. Cl. B63b *21/00*
U.S. Cl. 114—235 **5 Claims**



A tug and barge push-tow combination joined rigidly in tandem; the forward part of the tug being held between an after bottom ramp of the barge and barge structure overhanging horizontal structure of the tug and between which wedges are forced; and the after part of the tug being held by barge and tug male and female structure that are respectively wedge shaped in three dimensions and cooperatively interfit with reinforced rubber pads therebetween that are compressed within their elastic limits but beyond a possibility of relative movement during forward motion of the combination.

3,613,629
BUOYANT CABLE TOWING SYSTEM

William A. Rhyne; William W. McCrory, Jr., and Ray R. Mallory, all of Panama City, Fla., assignors to The United States of America as represented by the Secretary of the Navy

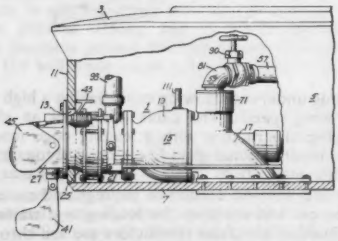
Filed Dec. 23, 1969, Ser. No. 887,570
Int. Cl. B63b *21/00*
U.S. Cl. 114—235 B **7 Claims**

An improved marine towing system particularly adapted for towing suitable gear along a predetermined course on the surface of shallow water is characterized by a novel diverter-float. The float is of a streamlined shape with an underwater tail surface which stabilizes the float from porpoising and a diverter assembly suspended rigidly beneath the float body by a clamp device secured therebetween.

3,613,630
MARINE JET PUMPOUT AND FIRE-FIGHTING EQUIPMENT

Frank Jacuzzi, Berkeley, Calif., assignor to Jacuzzi Bros., Incorporated

Filed June 7, 1965, Ser. No. 461,972
Int. Cl. B63h *11/00*
U.S. Cl. 115—12 R **10 Claims**

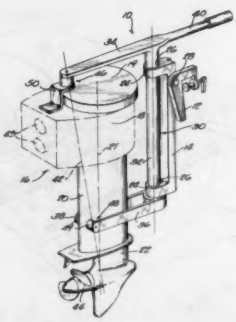


In combination, a vessel, a jet pump assembly in said vessel, having an intake end, flow connected exteriorly of said vessel below the waterline thereof, and a discharge end at the stern of said vessel for jet propulsion discharge, and including a pump intermediate said intake end and said discharge end, means for steering said vessel, means for reversing, in varying degrees, said discharge, to effect and control reverse direction of movement of said vessel, pump-out means flow coupled to said pump assembly intake end and exposed to the suction side of said pump, and means, independent of said steering and reversing means, for adjustably diverting a portion of the discharge of said pump for use other than jet propulsion.

3,613,631
OUTBOARD MOTOR ISOLATION SYSTEM

Gerald H. Wick, Menomonee Falls, and Theodore J. Holtermann, Milwaukee, both of Wis., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Sept. 4, 1969, Ser. No. 855,292
Int. Cl. B63h *21/26*
U.S. Cl. 115—17 **7 Claims**



Disclosed herein is a sound and vibration isolation mounting arrangement for an outboard motor having a marine propulsion unit mounted rearwardly of the steering axis of the outboard motor and including a power head, and a lower unit including a drive shaft housing and a gear case. The torque roll axis of the propulsion unit extends approximately vertically through the power head, drive shaft housing and lower unit gear case. The mounting arrangement includes an upper resilient mount connected to the top of the power head and a lower resilient mount positioned on each side of the lower end of the drive shaft housing. The upper and lower mounts have elastic axes which are coaxially arranged with respect to the torque roll axis of the propulsion unit.

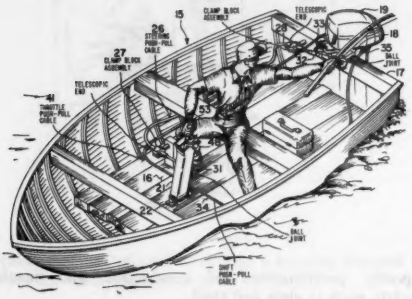
3,613,632
COMBINED STEERING, SHIFT AND THROTTLE CONTROL FOR OUTBOARD, INBOARD, OR INBOARD-OUTBOARD POWERED BOATS

Alfred J. Farrell, 21 Cleveland Ave., Sayville, N.Y.

Filed Aug. 15, 1969, Ser. No. 850,391
Int. Cl. B63h *21/26*
U.S. Cl. 115—18 **5 Claims**

A combined steering, shift and throttle control for outboard, inboard, or inboard-outboard powered boats in which a single capstan lever is pivoted upon the front of the boat for tilting movement to right or left and is connected through push-pull cables or similar devices to a steerable outboard motor rudder or to the outboard part of the

inboard-outboard drive combination at the rear of the boat to effect steering control of the boat and the shift and throttle of the outboard motor part or rudder. This capstan lever has handles extending from the top thereof which can be grasped by the pilot to effect steering movement of the lever. The upper end of the capstan lever is flaired and tightly receives the removable casings of throttle and shift levers



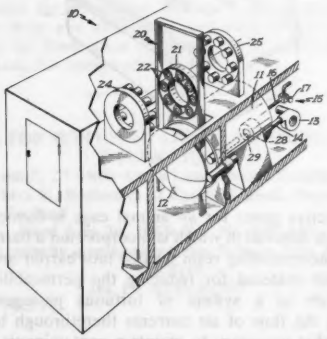
that are connected through push-pull cables with the outboard or inboard motor. Various connections are made from the capstan lever to the outboard motor to effect the steering of the outboard motor, not only in the form of a push-pull cable, but rod linkage and telemetric hydraulic cylindrical device. An instrument panel may be provided upon the capstan where it can be easily viewed by the pilot.

3,613,633

METHOD AND APPARATUS FOR COATING ARTICLES UTILIZING ROTATING CRUCIBLE COATING APPARATUS INCLUDING A CENTRIFUGAL-TYPE CRUCIBLE

Donald E. Anderson, Northfield, Minn., assignor to G. T. Schjeldahl Company, Northfield, Minn.

Filed Mar. 18, 1970, Ser. No. 20,643
Int. Cl. B05c *11/14*
U.S. Cl. 118—5 **10 Claims**



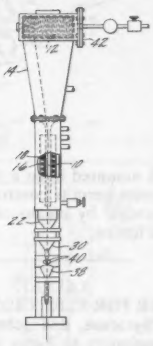
An evaporative deposition system including a chamber having means for evacuation and control of atmosphere, an evaporant-retaining crucible within said chamber having a generally closed cylindrical surface with a generally centrally disposed axis, the crucible having in-turned edge surfaces at either end thereof. Means are provided for heating the crucible, with the heating means being disposed generally radially outwardly of the closed cylindrical surface. In addition, means are provided for rotating the crucible about the central axis at an arcuate rate for centrifugally maintaining evaporant adjacent the inner surface of said closed cylindrical surface, and means are provided for inserting and retaining an article to be coated within said closed cylindrical surface. The article inserting and retaining means holds the article being coated in "sight" of the evaporant, and is provided with thermal control means for controlling substrate temperature, the control means maintaining contact with an interior surface of the article being coated.

3,613,634

STRAND IMPREGNATION APPARATUS

John J. Fiedorowicz, Cromwell, and Romeo L. Lamonde, East Hartford, both of Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Oct. 30, 1969, Ser. No. 872,647
Int. Cl. C23c *13/10*
U.S. Cl. 118—50 **3 Claims**



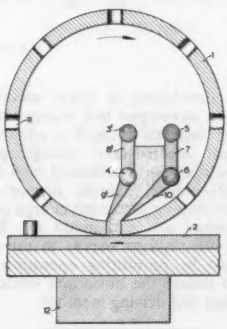
Strand immersion means include vertically aligned and spaced-apart funnels disposed within a vacuum system. Strand supply and heating means are disposed within the vacuum system.

3,613,635

APPARATUS FOR THE SPOT APPLICATION OF ADHESIVES TO CONTINUOUS SHEET MATERIAL

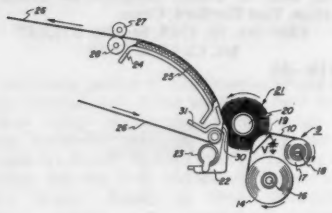
Hans Brehm, Fuerth, Odenwald, Germany, assignor to Carl Freudenberg, Weinheim, Germany

Filed Aug. 8, 1969, Ser. No. 848,459
Claims priority, application Germany, Mar. 13, 1969, P 19 12 773.2
Int. Cl. B05c *3/00*
U.S. Cl. 118—406 **6 Claims**



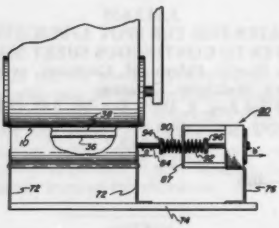
Apparatus for spot printing a powder onto a substrate including a perforated hollow roller; means for rotating the roller relative to a textile or other substrate; and hopper means within the hollow roller for holding the powder which hopper means mouth is about equal to the diameter of the perforations in the roller and registers with the perforations only when the perforations are adjacent the substrate.

3,613,636
ELECTROGRAPHIC DEVELOPER
Nicholas M. Soures, Penfield, N.Y., assignor to Xerox Corporation, Rochester, N.Y.
Filed Mar. 10, 1969, Ser. No. 805,696
Int. Cl. B05b 5/00
U.S. Cl. 118—637 7 Claims



A pretoned web mounted upon a supply roll and a takeup roll to form a cassette permits controlled deposition of toner onto a fibrous member by means of mechanical, electrical and triboelectrical forces.

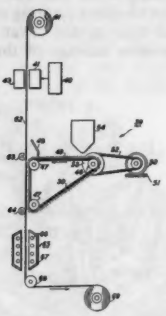
3,613,637
DEVELOPER FOR ELECTROSTATIC IMAGES
Dinesh S. Shah, Syracuse, and John F. Gardner, Penfield, both of N.Y., assignors to Xerox Corporation, Rochester, N.Y.
Filed June 16, 1969, Ser. No. 833,459
Int. Cl. G03g 13/00
U.S. Cl. 118—637 2 Claims



Apparatus for developing a latent electrostatic charge pattern including a developer bed comprising a supporting plate positionable beneath at least a portion of a surface having the latent electrostatic charge pattern formed thereon. The developer bed is vibrated by a driving member to fluidize the developer material supported thereon for contacting and developing the latent charge pattern. The bed and driving member are suspended by flexors and are coupled together by resilient means to minimize the drive force requirements by permitting operation at mechanical resonance and to isolate the noise and vibrations generated by the vibrating bed and driving member.

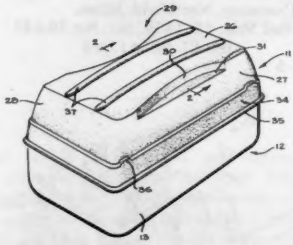
3,613,638
MATERIALS FOR FIBROUS DEVELOPMENT MEMBER
Thomas W. Solarek, West Walworth, N.Y., assignor to Xerox Corporation, Rochester, N.Y.
Filed Oct. 27, 1969, Ser. No. 869,673
Int. Cl. G03g 13/00
U.S. Cl. 118—637 7 Claims

In a device for developing electrostatic latent charge patterns, a fibrous development member comprising woven pile material, the fiber elements of which comprise



composite combinations of conductive and insulating materials, such as glass and steel.

3,613,639
ANIMAL CAGE PROTECTIVE COVER AND METHOD OF MAKING SAME
Charles A. Lee, and Frank D. Sorrells, both of Knoxville, Tenn., assignors to Appleton Wire Works Corporation, Appleton, Wis.
Continuation-in-part of application Ser. No. 766,755, Oct. 11, 1968, now Patent No. 3,528,227. This application Feb. 12, 1970, Ser. No. 10,788
Int. Cl. A01k 01/00; B01d 39/00
U.S. Cl. 119—15 9 Claims

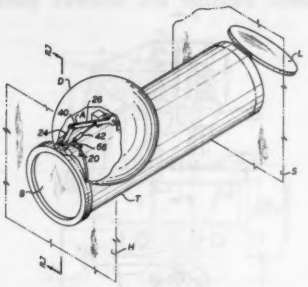


A protective cover for an animal cage is formed from a fibrous web material in which is incorporated a barrier media having a thermosetting resin formed into barrier areas in the fibrous web material for reducing the permeability of the fibrous web to a system of tortuous passageways and restricting the flow of air currents therethrough to a value less than that necessary to maintain contaminants airborne, thereby eliminating the transport of such contaminants into or out of such animal cage. The cover may be made by thermoforming the fibrous web into a shape to fit over and seal with the animal cage.

3,613,640
COMMUNICATING PASSAGE FOR SUBMERSIBLE VESSELS
Paul Cohen, Glen Cove, N.Y., assignor to Subcom, Inc., Glen Cove, N.Y.
Filed Aug. 8, 1969, Ser. No. 848,419
Int. Cl. B63g 8/00
U.S. Cl. 114—16 R 12 Claims

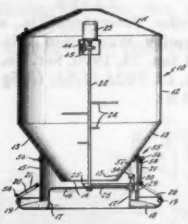
A communicating passage for submersible vessels

including a tube, a door frame facing inwardly of the tube, a door hinge means for moving said door into engagement with



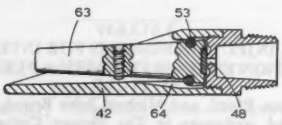
the frame and out of said tube, and a housing integral with said tube for receiving said door.

3,613,641
AUTOMATIC ELECTRIC HOG FEEDER
Petrus Jacobus Geerlings, P.O. Box 179, Waterloo, Iowa
Filed Mar. 26, 1970, Ser. No. 22,945
Int. Cl. A01k *5/02, 39/00*
U.S. Cl. 119—51.11 **9 Claims**



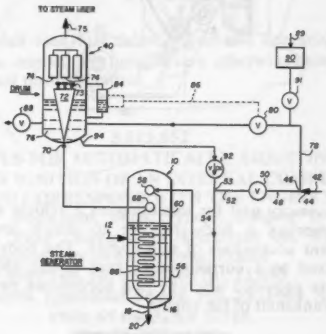
Apparatus for dispensing feed to animals automatically, including large and small pigs, and with control means for operating the mechanism intermittently to maintain a supply of feed ready for consumption.

3,613,642
DEVICE FOR SUPPLYING ANIMALS WITH WATER OR OTHER LIQUID
George Restall, 27 Little Aston Lane, Sutton Coldfield Warks, and Robert M. Hattersley, 2 Eastfield Road, Royston Herts, both of England
Filed June 30, 1969, Ser. No. 837,837
Claims priority, application Great Britain, July 2, 1968, 31529/68
Int. Cl. A01k *07/00*
U.S. Cl. 119—75 **5 Claims**



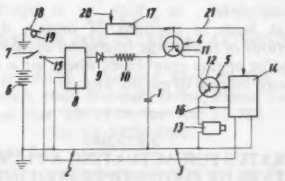
The invention provides a device such as a drinking nozzle for supplying animals with water or other liquid and comprises a housing, a pivotable valve operating member extending from the housing such that when an animal takes the valve-operating member in its mouth and pivots the valve-operating member liquid flows into the animal's mouth. The device is also provided with a fixed extension extending from the housing adjacent the valve-operating member in order to guard the valve-operating member against operation by an animal leaning against the valve-operating member. The animal pivots the valve-operating member to obtain a supply of liquid by squeezing the valve-operating member and the fixed extension together in its mouth.

3,613,643
COMBINED ONCE-THROUGH AND NATURAL CIRCULATION VAPOR GENERATOR
Robert O. Barratt, Parsippany, N.J., assignor to Foster Wheeler Corporation, Livingston, N.J.
Filed July 18, 1969, Ser. No. 851,769
Int. Cl. F22b *1/06*
U.S. Cl. 122—34 **3 Claims**



A sodium-heated vapor generator used in connection with a sodium-cooled fast breeder reactor is provided with means for supplying feedwater to the vapor generator in the event of feed pump failure, low-load operation, or reactor shutdown. Accordingly, a check valve will complete a natural circulation circuit to provide the necessary feedwater until water can be supplied from a suitable emergency supply.

3,613,644
FUEL INJECTION DEVICE
Ferdinand Anton Ernst Porsche, Stuttgart-Nord, and Paul Breyer, Rutesheim, both of Germany, assignors to Firma Dr.-Ing. h.c.F. Porsche K.G., Stuttgart-Zuffenhausen, Germany
Filed May 12, 1969, Ser. No. 823,612
Claims priority, application Germany, May 24, 1968, P 17 51 403.3
Int. Cl. F02m *51/00*
U.S. Cl. 123—32 EA **19 Claims**



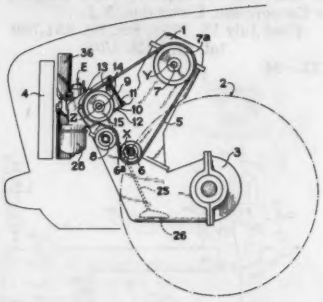
A fuel injection installation, especially for multicylinder internal combustion engines with at least one electromagnetically actuated injection valve and an energy storage device in the load circuit which is triggered in dependence on the rotational speed and in which the discharge of the energy storage device acting on the electromagnet of the injection valve is limited by a control device to a value above the holding current of the injection valve.

3,613,645

ACCESSORY UNIT FOR AN ENGINE OF A VEHICLE AND AN ENGINE EQUIPPED WITH SAID UNIT

Armand Froumajou, Pontoise, France, assignor to Automobiles Peugeot, Paris, France and Regie Nationale des Usines Renault, Billancourt, France

Filed Nov. 19, 1969, Ser. No. 878,068
Claims priority, application France, Dec. 2, 1968, 176,181
Int. Cl. F02m *67/00, 77/00;* B60k *11/04*
U.S. Cl. 123—41.46 6 Claims



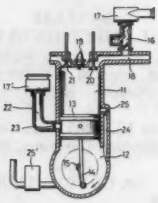
An accessory unit for mounting on a vehicle engine. The unit comprises a body relative to which are mounted component accessories of said engine. The body is adapted to be fixed to a corresponding face of the engine. Drive means are provided whereby said accessories can be driven by the crankshaft of the engine.

3,613,646

SECONDARY AIR INJECTION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Souichi Hisada, 460 11-2, 2-chome, Nishiki-cho, Naka-ku, Nagoya, Japan

Filed Sept. 10, 1969, Ser. No. 856,540
Int. Cl. F02b *75/02*
U.S. Cl. 123—75 CC 1 Claim



A secondary air-injecting system for obtaining a large compression ratio with a small engine stroke and for burning fuel gas completely, in which air is injected in engine cylinders at least in portions of intake, detonation and exhaust periods of the engine operation cycle from a separate air tank and/or engine crankcases where air is compressed by the downward motion of engine pistons.

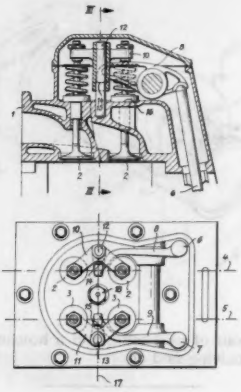
3,613,647

APPARATUS FOR ACTUATING A PLURALITY OF VALVES OF PISTON-OPERATED INTERNAL COMBUSTION ENGINES

Hermann Mettig, Rodenkirchen; Ernst-Siegfried Hartmann, Rosrath, and Georg-Wilhelm Lewen, Menden, all of Germany, assignors to Klockner-Humboldt-Deutz Aktiengesellschaft, Cologne, Deutz, Germany

Filed Feb. 11, 1970, Ser. No. 10,432
Claims priority, application Germany, Feb. 12, 1969, P 19 06 882.7
Int. Cl. F01l *1/26, 1/18*
U.S. Cl. 123—90.22 7 Claims

An apparatus for actuating valves for effecting a change in the charge of a piston machine, especially piston-operated internal combustion engine, in which the valve control is effected by yoke means controlling two valves, and in which the guiding means for the yoke means are laterally offset with regard to the area of engagement of said yoke means by the yoke-actuating means.

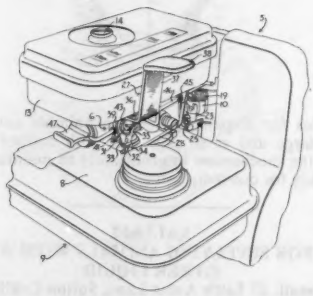


3,613,648

ENGINE CARBURETOR WITH THROTTLE CONTROL LEVER

Charles Robert Peifer, Pewaukee, Wis., assignor to Briggs & Stratton Corporation, Wauwatosa, Wis.

Filed Jan. 23, 1970, Ser. No. 5,218
Int. Cl. F02d *11/08;* G05g *5/06*
U.S. Cl. 123—103 R 5 Claims



The throttle valve in the carburetor of an internal combustion engine is manually controlled by a lever pivotally mounted directly on one side of the body of the carburetor at a location beneath the air cleaner on the carburetor air inlet duct.

3,613,649

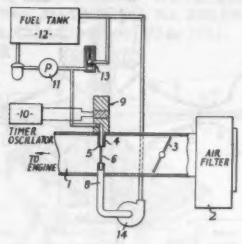
FUEL INJECTION SYSTEMS FOR INTERNAL-COMBUSTION ENGINES FED WITH A FUEL-AND-AIR MIXTURE

Norman Moss, Ilford, and Michael John Broad, Enfield, both of England, assignors to The Plessey Company Limited, Ilford, Essex County, England

Filed June 1, 1970, Ser. No. 42,274
Claims priority, application Great Britain, June 25, 1969, 32009
Int. Cl. F02m *27/08;* F02b *51/06*
U.S. Cl. 123—119 E 4 Claims

In a fuel injection system for a mixture-aspiring internal-combustion engine, fuel is injected through a nozzle unit equipped with an ultrasonic transducer so that when the

transducer is deenergized the nozzle produces a solid jet passing across the induction pipe of the engine into a collector tube through which the fuel returns to the fuel tank, while when the transducer is energized, the jet disintegrates, the fuel being atomized and therefore substantially all



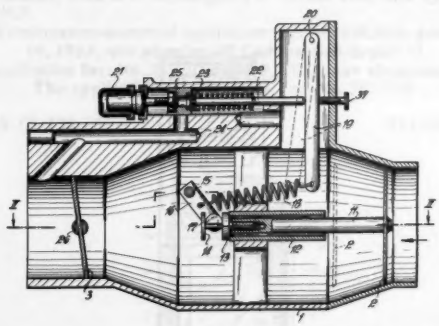
admixed to the induced air. The quantity of fuel thus introduced during each stroke or revolution with the airflow in the induction pipe is determined by the length of the energization period of the transducer.

3,613,650

FUEL INJECTION SYSTEM FOR INTERNAL COMBUSTION ENGINES

Gerhard Stumpp, Stuttgart, and Klaus-Jurgen Peters, Affalterbach, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Dec. 11, 1969, Ser. No. 884,206
Claims priority, application Germany, Dec. 14, 1968, P 18 14 848.6
Int. Cl. F02n *69/00;* **F02d** *3/02*
U.S. Cl. 123—119 **6 Claims**



In the suction tube of an internal combustion engine there is disposed a regulator member which is displaceable by air pressure against the force of a return spring tensioned as a function of engine temperatures. Said regulator member is associated with a fuel metering device to vary the proportion of fuel in the fuel-air mixture. The fuel quantities are also varied as a function of an arbitrarily set butterfly valve disposed in the suction tube.

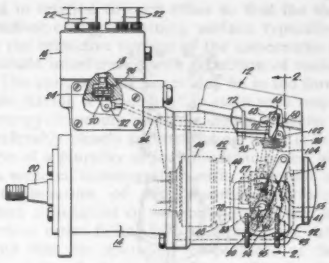
3,613,651

MINIMUM-MAXIMUM GOVERNOR WITH FULL LOAD TORQUE CONTROL

Warren E. Snyder, Wilbraham; John B. Cavanaugh, West Springfield, and Jean-Paul R. Aubin, South Hadley, all of Mass., assignors to AMBAC Industries, Incorporated, Springfield, Mass.

Filed Sept. 15, 1969, Ser. No. 857,828
Int. Cl. F02d *1/04*
U.S. Cl. 123—140 **12 Claims**

A governor for diesel engines and the like adapted to mechanically sense engine speed and to regulate fuel delivery during engine idling and at speeds in excess of rated engine speed. In addition, the governor provides an automatic



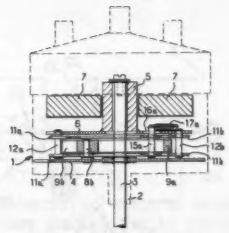
control of full load fuel delivery over the operating speed range of the engine, the fuel delivery otherwise being under direct manual throttle control.

3,613,652

APPARATUS FOR AUTOMATICALLY ADJUSTING THE TIMING OF IGNITION OF AN INTERNAL COMBUSTION ENGINE TO CORRESPOND WITH THE ENGINE SPEED

Jean Henri Stellwagen, Paris, France, assignor to Societe Anonyme Pour l'Equipement Electrique des Vehicules, S.E.V. Marchal, Issy les Moulineaux, France

Filed Feb. 16, 1970, Ser. No. 11,485
Claims priority, application France, Feb. 18, 1969, Aug. 12, 1969, 69 04032;69 27755
Int. Cl. F02p *5/06*
U.S. Cl. 123—146.5 **9 Claims**



An apparatus for automatically adjusting the timing of ignition of an internal combustion engine by changes in centrifugal force caused by changes in the speed of the engine. The apparatus is particularly useful as a component of an automobile engine.

3,613,653

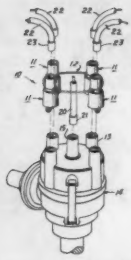
IGNITION DEVICE FOR INTERNAL COMBUSTION ENGINE

Eugene Irvin, Jr., 6635 Lakewood Blvd., Dallas, Tex., and Edwin A. Carrell, 1608 Westlake Drive, Plano, Tex.

Filed Mar. 23, 1970, Ser. No. 21,782
Int. Cl. F02p *9/00*
U.S. Cl. 123—146.5 A **8 Claims**

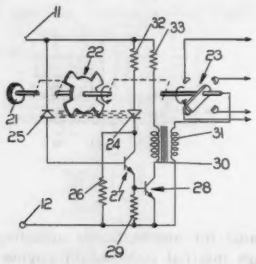
An air pollution control device for use in the ignition system of an internal combustion engine for applying a nonigniting electrical potential to nonfiring cylinders of the engine responsive to current flow to the firing cylinder including an assembly having a spark plug lead coupler connectible into each spark plug lead socket of the distributor head and engageable by the spark plug lead for that particular socket, each coupler having a conductor engageable at a lower end in the distributor head socket and contacted at the upper end by the spark plug wire. A conductive sleeve is secured in spaced electrically insulated relation around the conductor through the coupler, the

sleeves in the several couplers of the device being electrically interconnected in series whereby a potential induced in a sleeve by electrical flow through the conductor within such



sleeve induces a similar potential in the sleeves of the other couplers inducing a potential in the conductors through such other couplers effecting a nonigniting potential at the plugs of the nonfiring cylinders.

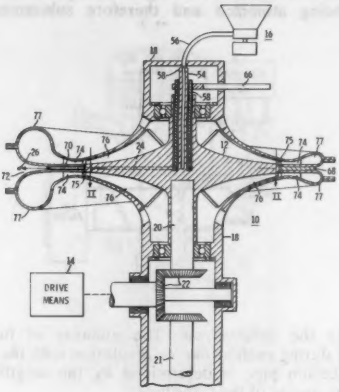
3,613,654
SPARK IGNITION SYSTEMS
Brian Gilbert, Sutton Coldfield, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England
Filed Jan. 7, 1970, Ser. No. 1,167
Claims priority, application Great Britain, Jan. 10, 1969, 1637/69
Int. Cl. F02p *7/02*
U.S. Cl. 123—148 E **5 Claims**



In a spark ignition system for an internal combustion engine there is an electrically powered radiation source and a radiation receiver. The engine drives means for exposing the receiver to the source when a spark is required, and to save power it is arranged that the source is operated at full power only when the receiver is exposed to the source.

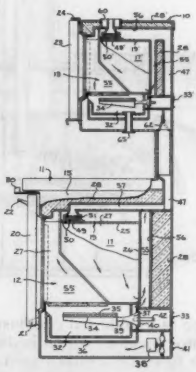
3,613,655
CENTRIFUGAL GUN
Joseph M. Tobin, McMurray; Peter O. Tauson, Bradford Woods; Leonard R. Fleischer, Pittsburgh, and Harry F. Ebner, Clairton, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed June 30, 1969, Ser. No. 837,441
Int. Cl. F41b *15/00*
U.S. Cl. 124—6 **5 Claims**

A centrifugal gun for discharging projectiles at very rapid velocities which gun includes a rotatable impeller having a center of rotation and a peripheral path of movement and having a continuous trackway along which the objects are propelled and which leads from the point of insertion at or near the rotation center to the exit point at the peripheral path. The trackway has an outer concave section and an inner convex section, with the outer peripheral portion of the



concave section facing the direction of rotation of the impeller.

3,613,656
PYROLYTIC CLEANING OF DOUBLE OVENS
Wayne L. Henderson, Louisville, Ky., assignor to General Electric Company
Filed Dec. 12, 1969, Ser. No. 884,500
Int. Cl. F24c *15/32*
U.S. Cl. 126—21 R **8 Claims**

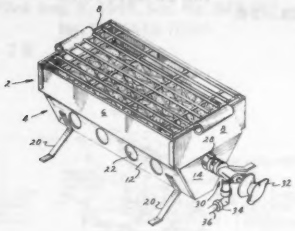


A double-oven gas range having a large master oven and a smaller companion oven. Each oven is provided with heating means for raising the temperature of the oven. The master oven has heating means with a capability of reaching and maintaining either a cooking temperature range or a pyrolytic ovenrcleaning temperature range. The companion oven has heating means with a capability of reaching and maintaining a cooking temperature range. The master oven has an exhaust vent that empties into a flue duct. The companion oven also has an exhaust vent that empties into the same flue duct. The flue duct has a damper for shunting the exhaust of the master oven into heat-transfer relation with the companion oven either for warming the companion oven, or when the master oven is operating on a pyrolytic oven-cleaning cycle for raising the temperature of the companion oven into the pyrolytic oven-cleaning temperature range for cleaning both ovens at the same time with the same heat source.

3,613,657
OUTDOOR COOKER WITH REUSABLE CARTRIDGE-TYPE GRILL UNIT

John E. Wilska, 840 Amostown Road, West Springfield; Harold F. Felix, 51 Irving St., West Springfield; John A. Dialessi, 267 Kings Hwy., West Springfield, Mass., and Fred C. Emerson, Old Main Road, Worthington, Mass.

Filed Nov. 26, 1969, Ser. No. 880,095
Int. Cl. A47j *37/00;* **F24c** *3/04*
U.S. Cl. 126—41 R **3 Claims**

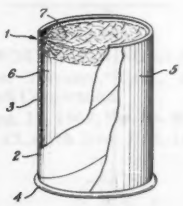


A portable outdoor cooking unit having a gas-fired burner element in the lower section of a container housing body with a cooking grill cartridge pack removably mounted in the upper section thereof, the pack being formed as a composite reusable grill unit having a lower panel or layer of noncombustible briquets secured between open metalwork members and a cooking grill surface supported in elevated relation thereto.

3,613,658
HEATING COMPOSITION

Edwin C. Knowles, Poughkeepsie, and Frederic C. McCoy, Beacon, both of N.Y., assignors to Texaco Inc., New York, N.Y.

Continuation-in-part of application Ser. No. 288,866, June 19, 1963, now abandoned , Continuation-in-part of application Ser. No. 229,205, Oct. 8, 1962, now abandoned. This application July 20, 1964, Ser. No. 383,785
Int. Cl. A01g *13/06*
U.S. Cl. 126—59.5 **33 Claims**



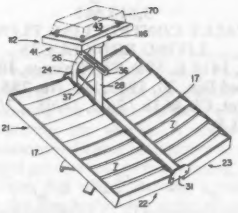
A heating composition consisting essentially of from 75 to 99.8 percent by weight of a wax component containing a microfibrous material component in contact with the wax in an amount sufficient to increase the burning rate of the composition. The microfibrous material component consists essentially of from 0.2 to 25 percent by weight of an inorganic substantially noncombustible material. The heating composition can be used as a fire starter and in a container as a solid fuel heater.

3,613,659
SOLAR-ENERGY-CONCENTRATING DEVICE

Robert M. Phillips, 326 Lakeview Way, Redwood City, Calif.

Filed Oct. 14, 1968, Ser. No. 767,072
Int. Cl. F24j *3/02*
U.S. Cl. 126—270 **47 Claims**

Presented is a solar-energy-concentrating device in which a reflector-concentrator panel is supported in such manner that radiant solar energy is intercepted by the reflector-concentrator panel and reflected onto a proportionately smaller radiant-energy-absorbing surface. The radiant-energy-absorbing surface and concentrator panel are supported in relation to each other so that the shadow cast by the radiant-energy-absorbing surface typically does not fall upon the reflective surface of the concentrator panel so as to preclude interference with reflection of radiant energy thereby. The concentrator panel may be in the form of a single module having a concentration ratio with respect to the radiant-energy-absorbing surface ranging between 6½–12 to 1, and preferably closely approximating 10 to 1; or it may be in the form of a plurality of such modular panels arranged to provide a selected concentration ratio or permit adjustment of the temperature of the absorbing surface through independent adjustment of one or more of the panels. For concentration ratios falling into this preferred range, it has been found that the operating temperature of the radiant-energy-absorbing device or surface will selectively range between 350° F. and 500° F. In another embodiment the reflector-concentrator panel is provided with a reflective



surface each increment of which is related to adjacent incremental surface areas so as to provide the desired predetermined concentration ratio. The radiant-energy-absorbing surface may be one surface of a flat plate arranged to absorb the radiant energy from the sun that is reflected to it by the concentrator panel, the heat from which may in turn be utilized for any appropriate purpose requiring a source of heat, as for instance to heat the interior of an oven chamber formed by placing an appropriate cover structure over the plate. The radiant-energy-absorbing surface is supported on a suitable frame in adjustable relation to the reflector-concentrator panel so that in all positions of the frame, giving effect to adjustments required to place the reflecting surface of the concentrator panel in relation to the sun so as to secure maximum efficiency, the radiant-energy-absorbing surface is maintained in a horizontal position so as to conveniently support objects thereon in heat transfer relation to the radiant-energy-absorbing surface.

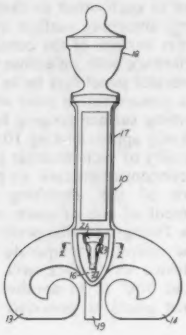
3,613,660
ANDIRON

Judkins E. Wilkinson, Birmingham, Ala., assignor to Atlanta Stove Works, Inc.

Filed Dec. 15, 1969, Ser. No. 884,886
Int. Cl. F23h *13/00, 17/12;* **F24b** *13/00*
U.S. Cl. 126—298 **1 Claim**

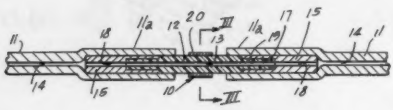
Upstanding front member of andiron has passageway therethrough with sides of passageway sloping downwardly and inwardly. Forward end of horizontal bar has downwardly and inwardly extending side portions corresponding to and

engaging sloping sides of passageway with wedgelike fit. Cooperating stop surfaces limit forward and rearward



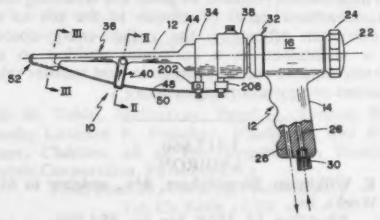
movement of side portions of bar relative to sloping sides of passageway.

3,613,661
MECHANICALLY CONTROLLING FLOW THROUGH LIVING BODY DUCTS
Nayan S. Shah, 1414 E. 59th ST., Chicago, Ill.
Filed Dec. 20, 1968, Ser. No. 785,521
Int. Cl. A61b *17/00, 17/08, 17/12*
U.S. Cl. 128—1 R **14 Claims**



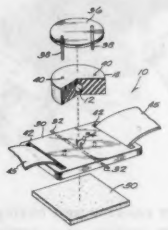
A living body duct may be mechanically blocked in a manner to enable unblocking of the duct when desired, by inserting into the duct a flow-blocking device, and more particularly a device having a valve maintaining the blocked condition of the duct as long as desired and which may be opened to resume normal flow through the duct.

3,613,662
COLD CONIZATION INSTRUMENT
Stavro A. Chrysostomides, Rt. 1, Box 124, Columbia, S.C.
Filed Feb. 27, 1970, Ser. No. 15,192
Int. Cl. A61b *10/00, 17/32;* **B26b** *07/00;* **E21b** *01/02;* **F15b** *13/04;* **F01d** *15/06*
U.S. Cl. 128—2 B **10 Claims**



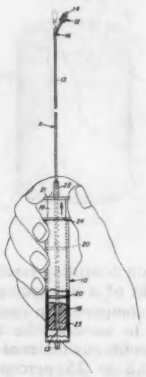
A medical instrument for removal of a conical section of tissue from the cervical is including the endocervical canal for obtaining a biopsy specimen in a procedure known as cold conization. The instrument utilizes a pistol grip on the body portion and a pneumatic air motor for reciprocal movement of a pair of coacting arcuate blades which may be rotated about the longitudinal centerline of the instrument and are positioned to remove a uniform conical biopsy section.

3,613,663
APPARATUS TO PROVIDE COMMUNICATION WITH THE VEINS OF A PATIENT
Roger P. Johnson, 5930 W. Siegfried Place, Milwaukee, Wis.
Filed Sept. 9, 1968, Ser. No. 758,504
Int. Cl. A61b *10/00*
U.S. Cl. 128—2 R **12 Claims**



An apparatus for obtaining blood specimens from a patient which includes a needle adapted to be temporarily injected and retained in communication with a vein of a patient and a body made of a self-sealing material with a cavity or void formed therein, which is in communication with the needle.

3,613,664
CONTROLLABLE TIP BRUSH FOR MEDICAL USE
James K. V. Willson, and Marshall Eskridge, both of Mobile Infirmary P. O. Box 7544, Mobile, Ala.
Filed June 25, 1969, Ser. No. 836,507
Int. Cl. A61b *10/00*
U.S. Cl. 128—2 R **3 Claims**



A flexible probe including a series of bristles at its extremity for exploring and collecting specimens from the labrynthine passages of internal organs is formed by attaching a series of bristles to the extremity of a tightly wound coil of fine wire, a section of wire coil near the bristles having adjacent turns whose cross sections are reduced at one side of the coil so that when the coil is put under tension by a core wire extending from one end to the other of the coil the extremity including the bristles will be turned in the direction of the reduced cross section, one element of a

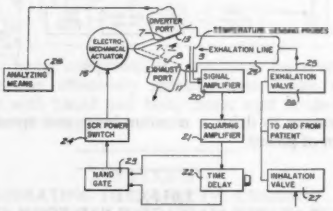
two-piece handle being attached to the other end of the coil, the other element of the handle being attached to the core wire and the two elements being in frictional engagement so that any degree of inclination of the bristles can be accomplished and maintained with one hand.

3,613,665

SAMPLING MEANS FOR EXHALED AIR

Reynolds G. Gorsuch, Suite 402, 642 W. 6th St., Los Angeles, Calif.

Filed Aug. 8, 1969, Ser. No. 848,587
Int. Cl. A61b *10/00*
U.S. Cl. 128—2 R 5 Claims



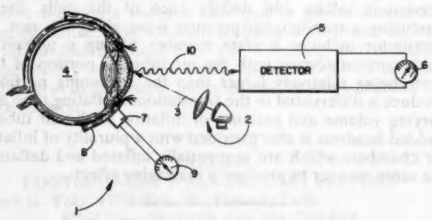
A valve and control therefor for separating the end tidal air or alveolar gas from air exhaled from a human or animal, wherein a valve, having two ports, is inserted in the exhalation line forming part of a breathing apparatus, the first port discharging to atmosphere, the second port discharging into a collection receptacle or analytical device; and wherein a control, including a temperature sensor, is located ahead of the valve to sense movement of exhaled air, is electrically connected to a variable time delay means operable to close the first port and open the second port after a preselected portion of the exhaled air has passed so a desired portion of the end tidal air may be collected or analyzed.

3,613,666

SYSTEM FOR DETECTING GLAUCOMA

Milo Oldell Hobbs, Torrance, Calif., assignor to North American Rockwell Corporation

Filed Aug. 11, 1969, Ser. No. 848,798
Int. Cl. A61b *3/16, 3/16, 3/00*
U.S. Cl. 128—2 6 Claims



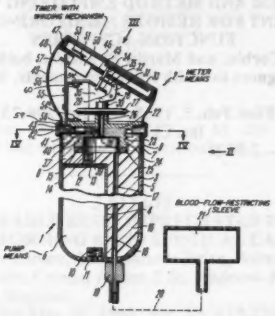
A light beam is directed at an eye being tested. The light is reflected to a detector. The eye is vibrated simultaneously by a vibrator placed adjacent to an eyelid. The response of the eye to the vibration as measured by the detector is calibrated to indicate pressure.

3,613,667

BLOOD-PRESSURE-MEASURING DEVICE WITH PULSE-RATE TIMER

Charlotte Beck, Stuttgart-Mohringen, Germany, assignor to Waller Beck KG. Kontroll-und Fernmessgerate, Stuttgart-Mohringen, Germany

Filed Apr. 1, 1969, Ser. No. 811,833
Claims priority, application Switzerland, Apr. 1, 1968, 4944
Int. Cl. A61b *5/02*
U.S. Cl. 128—2.05 G 6 Claims



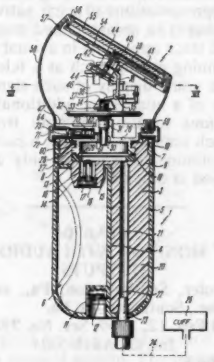
A sphygmomanometer for use with a pressurizable, blood-restricting sleeve has a cylindrical housing comprising a core formed with a lateral hollow and an elastic skin stretched over the core spanning the hollow to form a hand-actuatable pump for pressurizing the sleeve. A short-interval timer (clock) and a pressure indicator responsive to pressure in the sleeve are mounted on one end of the housing and each has a scale on a common dial plate. Turning a rotatable control ring surrounding the housing in one sense actuates a valve for bleeding the sleeve to measure blood pressure, and turning it in the other sense starts the timer for measurement of pulse rate.

3,613,668

SPHYGMOMANOMETER WITH BUILT-IN TIMER

Charlotte Beck, Stuttgart-Mohringen; Karl Roll, Oberaichen, Wurttemburg, and Fritz Kummer, Stuttgart, all of Germany, assignors to Walter Beck KG. Kontroll-und Fernmessgerate, Stuttgart-Mohringen, Germany

Filed Apr. 1, 1969, Ser. No. 811,940
Claims priority, application Switzerland, Apr. 1, 1968, 4943/68
Int. Cl. A61b *5/02*
U.S. Cl. 128—2.05 G 17 Claims



A sphygmomanometer operable with one hand has a cylindrical housing in which a pump for inflating a blood-

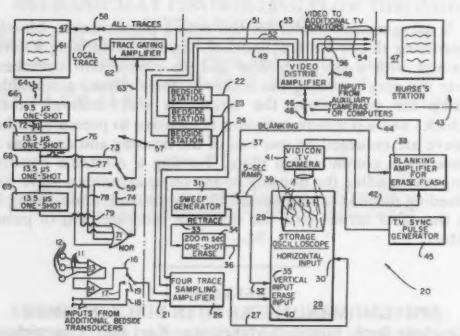
flow-restricting sleeve is formed by a deflectable wall of the cylindrical housing. A meter for monitoring pressure is removably fitted on the end of the housing, and a control ring surrounds the housing axis between the meter and pump. A valve for bleeding the air from the sleeve is operated by rotation of the control ring. Means are provided for centering the pointer of the meter at a zero indication and for establishing the desired ratio of pressure to meter displacement. A timer is also provided which has a dial on the meter face and which is controlled by the ring.

3,613,669

SYSTEM AND METHOD EMPLOYING VIDEO EQUIPMENT FOR REMOTE MONITORING OF BODY FUNCTION ACTIVITIES

Thomas H. Corbin, and Martin E. Kienitz, both of Palo Alto, Calif., assignors to Smith Kline Instruments, Inc., Palo Alto, Calif.

Filed Feb. 5, 1969, Ser. No. 796,732
Int. Cl. A61b *5/04*
U.S. Cl. 128—2.06 R **12 Claims**



A plurality of body function activities such as cardiac conditions are monitored from a single remote station and electric signal representations of each activity so monitored are stored temporarily in an associated storage register such as a given related trace appearing in avisual display of several such traces. Scanning means, such as a television or vidicon camera scans the visual display of such signals and transmits them all to each of a number of additional viewing stations assigned to various locations remote from the scanning apparatus. At each scanning location, a portion of the visual display can be eliminated whereby only a given pertinent portion is displayed at that station.

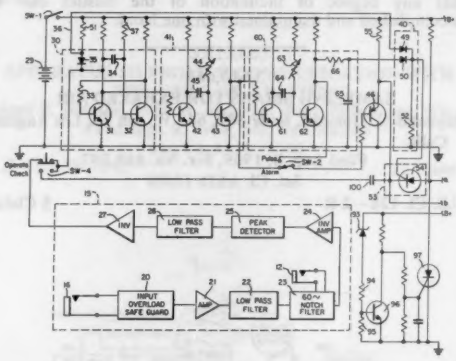
3,613,670

HEARTBEAT MONITOR WITH AUDIO AND VISUAL OUTPUTS

Harry J. Edenhofer, Southampton, Pa., assignor to Princo Instruments, Inc., Southampton, Pa.

Filed Feb. 12, 1969, Ser. No. 798,676
Int. Cl. A61b *5/04*
U.S. Cl. 128—2.06 F **3 Claims**

A pocket size, self-contained cardiac monitor for on-patient or central station monitoring by visible and/or audible signals related to the beat of a patient's heart, the monitor having the features of: using its own circuitry for calibration; having a time delay to mask out spurious signals; and having



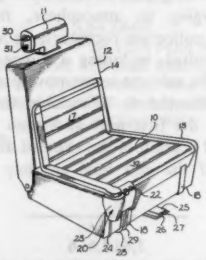
circuit means to drive a monitor lamp and speaker with a minimum of power.

3,613,671

INFLATABLE MASSAGING PAD FOR A SEAT

John H. Poor, 32582 Crete Drive, Laguna Niguel, Calif., and Charles H. Logan, 4828 Tilden Ave., Sherman Oaks, Calif.

Filed Aug. 7, 1968, Ser. No. 750,987
Int. Cl. A61h *1/00*
U.S. Cl. 128—24 R **15 Claims**



A seat pad having a fabric cover attached to a pad base and a plurality of inflatable cells spaced parallel within the cover. Each of the inflatable cells is closed at one end and connected at the other end to an air tube which communicates with a compressed air source and the atmosphere. A distributor is interconnected between the air tubes, and the compressed air source and atmosphere to sequentially distribute the compressed air to the air tubes to alternately distribute the compressed air to the air tubes to alternately inflate and deflate each of the cells, thereby producing a translational pressure wave along the seat. The distributor includes a plate member having a plurality of ports communicating with the air tubes, a portion of these ports being relatively larger than the remaining portion to produce a differential in the translational inflating time and a varying volume and pressure of inflation in the air tubes. A padded headrest is also provided with a plurality of inflatable air chambers which are sequentially inflated and deflated in the same manner to produce a massaging effect.

3,613,672

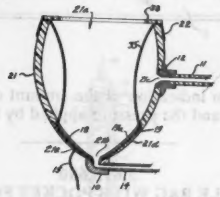
MECHANICAL VENTRICULAR ASSISTANCE CUP

Peter Schiff, R.D. #2, Lambertville, N.J.

Filed July 9, 1969, Ser. No. 840,253
Int. Cl. A61h *29/00*
U.S. Cl. 128—24.5 **11 Claims**

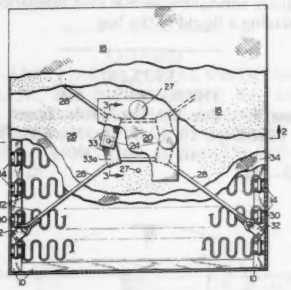
An improved mechanical ventricular assistance cup for assisting a heart in the performance of its pumping

operations or for aiding the heart in achieving normal pumping rhythm, which cup assembly is provided with a semiflexible or inflatable powder shell to reduce the size of the incision required for implanting the mechanical pump



and further being comprised of constituent materials which render the cup effectively indestructible, make the cup compatible with blood and body tissue and further act to provide a sturdier cup structure.

3,613,673
VIBRATING THERAPEUTIC CUSHION
Joseph E. La Hue, 3806 S.E. Lincoln, Portland, Oreg.
Filed Feb. 10, 1969, Ser. No. 797,842
Int. Cl. A61h *1/00*
U.S. Cl. 128—33 **7 Claims**



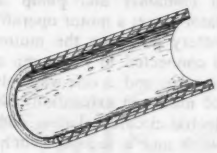
A vibrating therapeutic cushion having vibrating means therein connected within a frame of the cushion by resilient tension members. The vibrating unit supported by the tension member includes a resilient base pad to which is secured a vibrating motor. Soft resilient padding is disposed between the motor and the base pad. The vibrating unit is applied independently of the upholstery springs an by its structure produces a substantially uniform vibration throughout the entire cushion.

3,613,674
FOOT-AND-LEG WALKING CAST SUPPORT
Robert G. Volz, 1750 Race St., Denver, Colo.
Filed Nov. 29, 1968, Ser. No. 779,669
Int. Cl. A61f *5/01, 5/04*
U.S. Cl. 128—83.5 **8 Claims**

A walking support is adapted for attachment to the bottom of a leg-and-foot walking cast and includes an elongated base spanning a substantial portion of the length and width of the bottom of the foot cast together with a convex, curved ground engaging surface. Flap extensions on each side of the base are adapted to fold over the cast and firmly secure the support to the cast to provide a forward and rearward

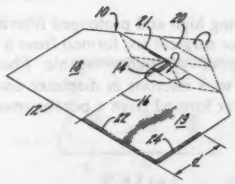
rocking motion on the curved base by the wearer and thereby afford the wearer a more normal gait.

3,613,675
PHOTOCURABLE RESIN IMPREGNATED BANDAGE FOR FORMING RIGID SURGICAL CASTS
Donald Wayne Larsen, 208 Ashlawn Drive, Ashton, Md., and Raymond John Ceresa, Alpine 2 St. Andrews Park, Histon, Cambridge, England
Filed May 22, 1969, Ser. No. 818,238
Int. Cl. A61f *13/04*
U.S. Cl. 128—90 **5 Claims**



A lightweight strong cast for the repair of broken bones is made by impregnating a fibrous felt with a photocurable resin, wrapping the felt in bandage form around the injured member until a sufficient thickness is built up, then curing the resin by exposing the wrapped "cast" to actinic radiation for a time sufficient to convert the impregnated wrapping into a rigid substance.

3,613,676
GENERAL PURPOSE DISPOSABLE OBSTETRICAL AND SURGICAL LEGGINGS
Dan D. Endres, and Ronald D. Carter, both of Neenah, Wis., assignors to Kimberly Clark Corporation, Neenah, Wis.
Filed Aug. 15, 1969, Ser. No. 850,379
Int. Cl. A61f *13/00;* **A61l** *15/00*
U.S. Cl. 128—132 **2 Claims**

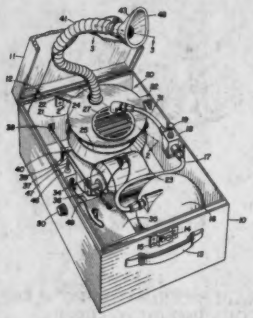


Disposable surgical leggings are provided for covering the upraised legs of a surgical patient. The leggings are made of a single sheet of flexible nonwoven material so folded and adhesively secured in order to form a compact package that is readily opened to afford an envelopelike leggings structure closed at one end.

3,613,677
PORTABLE RESUSCITATOR

Joseph Blasko, Toronto, Ontario, Canada, assignor to Abbott Laboratories

Filed Dec. 7, 1964, Ser. No. 416,204
Int. Cl. A62b 7/02
U.S. Cl. 128—145.6 2 Claims



A portable resuscitator comprising: an open top casing; a lid hingedly mounted on the casing; a container of oxygen under pressure removably positioned in the casing; a bellows-type pump in the casing having an air inlet; a conduit connecting said container and pump and including an adjustable regulator valve; a motor operatively connected to the pump; a battery powering the motor; a flexible hose having one end connected to the pump and a deformable face mask at the other end; a one-way valve at the joindure of said hose and mask; an exhalation valve carried by the mask; and an electric circuit including said battery, motor, a lid operated switch and a second switch operated by the deformable edge of the mask.

3,613,678
FILTRATION MASK

Delbert J. Mayhew, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Continuation-in-part of application Ser. No. 623,369, Mar. 15, 1967, now abandoned. This application Feb. 24, 1970, Ser. No. 14,210
Int. Cl. A62b 23/06
U.S. Cl. 128—146.2 10 Claims

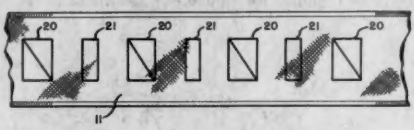
A face mask having high and prolonged filtering efficiency specially adapted for surgical use formed from a filtering web composed entirely of synthetic organic fibers including filtering fibers 0.5 to 6 microns in diameter and a nonfuzzy face contacting layer formed from a porous smooth-surfaced thermoplastic film.

3,613,679
ELASTIC BANDAGE WITH TENSION INDICATOR

Patricia W. Bijou, P.O. Box 254, Brookhaven, N.Y.

Filed Oct. 1, 1969, Ser. No. 862,714
Int. Cl. A61f 13/00
U.S. Cl. 128—169 7 Claims

A series of figures forming an overall pattern is applied to the surface of an elastic bandage. When the bandage is stretched, the contours of the figures and/or their position relative to each other are altered. The degree of such

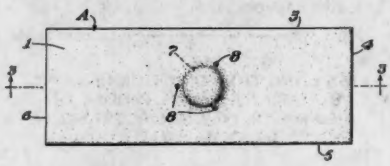


alternation is an indication of the amount of tension existing in the bandage and the pressure applied by the bandage.

3,613,680
DISPOSABLE BAG WITH POCKET FOR SOLUBLE SUBSTANCE

Paul A. Zamarra, Lake Road, Far Hills, N.J.

Filed Mar. 4, 1969, Ser. No. 804,234
Int. Cl. A61m 3/00
U.S. Cl. 128—224 1 Claim

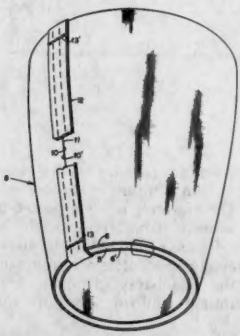


A disposable bag, for example, a liquid container for a syringe has on or between opposed portions of its thin, flexible and collapsible wall a pocket for preloading or storing a soluble substance, so that said substance is dissolved merely by placing a liquid in the bag.

3,613,681
THERAPEUTIC AID

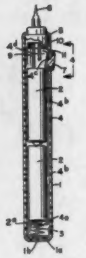
Joe R. Adams, P.O. Box 489, Cookeville, Tenn.

Filed Sept. 10, 1969, Ser. No. 856,774
Int. Cl. A61f 7/00
U.S. Cl. 128—293 7 Claims



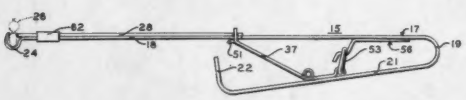
A therapeutic aid comprising a closed cell, resilient, foamed elastomeric sheath dimensioned to be received in circumscribing relation about an afflicted body area, said elastomer being not more than about one-fourth inch thick and forming an effective thermal and moisture barrier between the afflicted body are and ambient atmosphere, and inner and outer isotonic surface coverings integrally bonded to and covering substantially the entire inner and outer surfaces of said elastomer sheath, said isotonic surface coverings being substantially equally tensioned with respect to each other and substantially tensioned with respect to said elastomer sheath.

3,613,682
DISPOSABLE CAUTERIES
Richard Norman Naylor, Clearwater, Fla., assignor to Concept, Inc., St. Petersburg, Fla.
Filed Feb. 5, 1970, Ser. No. 8,878
Int. Cl. A61n 3/00
U.S. Cl. 128—303.1 6 Claims



A disposable hand-held portable cautery powered by self-contained energizers or batteries for energizing an electrode heating tip which is mounted in an insulating tube provided with a removable protective cap or cover encompassing the heating tip and the upper end of the tube, and the tube is further provided with a simple depressible latching or locking switch button on the tube, so that a portion of the button will frictionally overlie the adjacent end portion of the cap assembled thereon to thus prevent energization of the heating tip while the tube and cap are assembled.

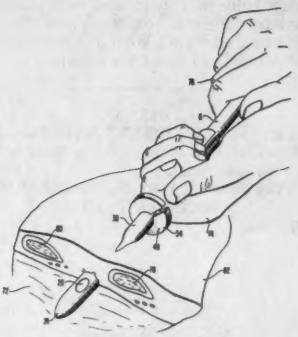
3,613,683
CLIP-APPLYING SURGICAL INSTRUMENT
George Kees, Jr., Box 113, Alexandria, Ky., and Horst R. Hickmann, Anderson Township, Hamilton County, Ohio
Filed June 4, 1969, Ser. No. 830,267
Int. Cl. A61b 17/12, 17/30; B23p 19/04
U.S. Cl. 128—325 2 Claims



A surgical instrument for applying an occlusion clip to a blood vessel including a pair of telescoping members, a hook on one of the members, the other member having an end portion adjacent the hook, the hook and the end portion being adapted to engage and operate arms of the clip for opening and closing the clip and means for telescopically moving the members to operate the clip.

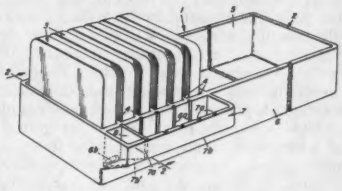
3,613,684
TROCAR CATHETERS
David S. Sheridan, Hook Road, Argyle, N.Y.
Filed Sept. 19, 1969, Ser. No. 859,413
Int. Cl. A61b 17/34; A61m 27/00
U.S. Cl. 128—347 3 Claims

A trocar catheter is formed with a rigid shaftlike stylet and an encircling catheter made of plastic material. The catheter has a molded rigid distal end member with a conical shape, a closed rounded tip fixed to a flexible tube, and at least one fluid opening through the side. The rigid distal end member has an interior that conforms to the shape of the stylet tip. The device may be used in emergency cases where the catheter is forced through the chest wall of a patient over the



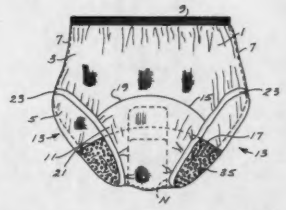
stylet which is then withdrawn to let fluid pass through the catheter or for suprapubic cystostomy procedures.

3,613,685
SURFACE-CONFORMING DISPOSABLE SURGICAL PREPARATION APPLICATOR AND TRAY THEREFOR
Verne J. Reynolds, 148 East Jefferson, Boise, Idaho
Filed July 8, 1969, Ser. No. 839,963
Int. Cl. A61m 35/00
U.S. Cl. 128—269 12 Claims



A combined surgical preparation compartmentalized applicator tray feeding solution to and individually storing therein ready for use hand-gripped surgical preparation applicators. Each of the surgical applicators is flexibly constructed to be surface conforming to the body areas being prepared for surgery. Each applicator after use is disposable.

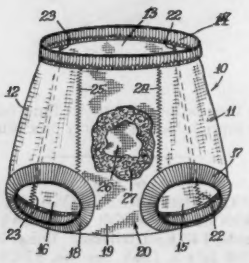
3,613,686
SANITARY PANTY GARMENT
Irvin S. De Woskin, St. Louis, Mo., assignor to Beltx Corporation, St. Louis, Mo.
Filed Feb. 25, 1970, Ser. No. 14,039
Int. Cl. A61f 13/16
U.S. Cl. 128—288 10 Claims



A sanitary panty garment having a crotch section formed from a laminate having an inner layer of a flexible stretchable

plastic foam material with a high coefficient of friction and an outer layer of stretchable synthetic fabric material, the layers being bonded together to form a material having a high-coefficient-of-friction inside surface and sufficient elasticity frictionally to engage and form a secure pocket around a sanitary napkin to hold it in place within the crotch section of the garment without fasteners or other attachments to stabilize its position therein.

3,613,687
QUICK-DRYING, ABSORBENT NETHER GARMENT
William J. Kennedy, Charlotte, N.C., assignor to The Kendall Company, Walpole, Mass.
Filed June 13, 1969, Ser. No. 833,036
Int. Cl. A61f *13/16*
U.S. Cl. 128—288 **15 Claims**

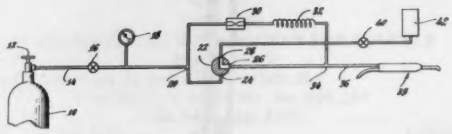


A highly liquid-retentive, quick-drying nether garment, such as a diaper or training pant for infants or adults, having a crotch area (which may be specifically defined) for covering the main excremental body orifices, including at least three flexible thicknesses each of one or more similar or dissimilar layers: (1) a centrally disposed thickness substantially of integrated hydrophobic fibers; (2) an innermost predominantly hydrophilic fiber thickness of one or more integrated layers; and (3) a thickness including one or more layers selected from those integrated layers consisting of hydrophilic fibers, hydrophobic fibers, mixtures of hydrophilic and hydrophobic fibers, substantially impervious films, microporous and apertured films and porous nonfibrous acretions and foams.

3,613,688
SANITARY TOWEL
Gunnar Dahlsten, Gothenburg, Sweden, assignor to Molnlycke Aktiebolag
Filed Sept. 21, 1964, Ser. No. 397,698
Claims priority, application Sweden, Sept. 25, 1963, 10,485/1963
Int. Cl. A61f *13/16*
U.S. Cl. 128—290 **3 Claims**

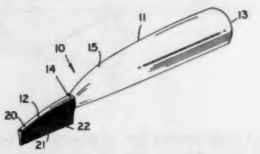
The sanitary towel is provided with fastening means at the end portions of the envelope enclosing the absorption body by which the conventional end loops may be omitted. The fastening means consists at each end portion of a narrow ring encircling said portion but leaving the terminal thereof uncovered. The portion between the ring and the absorption body is also uncovered. The ring may consists of artificial resin intimately united with the material of the envelope.

3,613,689
CRYOSURGICAL APPARATUS
Ralph E. Crump, Trumbull; Frank L. Reynolds, Monroe, and Carl R. Tillstrom, Fairfield, all of Conn., assignors to Frigitronics of Conn., Inc., Bridgeport, Conn.
Filed Jan. 13, 1970, Ser. No. 2,491
Int. Cl. A61b *17/36*
U.S. Cl. 128—303.1 **10 Claims**



A cryosurgical apparatus primarily adapted for use with gases which cool when expanded from a high-pressure state to a low-pressure state. The apparatus includes an expansion chamber which receives gas through a supply tube. The gas is supplied from a selector valve at either a high pressure or a low pressure. The supply tube includes a self-acting valve which is normally biased open when gas is supplied at low pressure but is forced closed by gas under high pressure. With the valve open, the expansion chamber is filled with the low-pressure gas and is substantially at room temperature. When the valve closes, high-pressure gas bypasses the automatic valve and enters the cooling chamber through a small orifice, expanding to a low-temperature state and cooling the expansion chamber.

3,613,690
HAIR REMOVAL TOOL
Francis Lee Newell, 5825 Harbord Drive, Oakland, Calif.
Filed July 25, 1969, Ser. No. 844,761
Int. Cl. A61b *17/00*; A01k *13/00*
U.S. Cl. 128—355 **6 Claims**

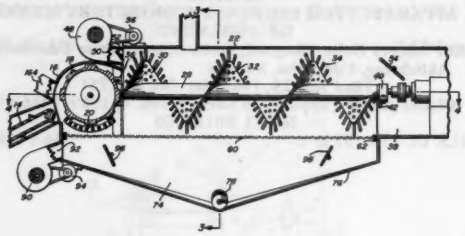


A hair removal tool comprising a handle having at one end a short blade having a stiff body with a relatively thin, blunt edge and sidewall surfaces that are serrated by crossing surfaces not perpendicular to the blunt edge.

3,613,691
GRAIN SEPARATOR FOR COMBINES
Albert R. Wilshusen, 116 East Cedar St., Liberal, Kans.
Filed Nov. 4, 1969, Ser. No. 873,910
Int. Cl. H01f *12/32*
U.S. Cl. 130—23 **9 Claims**

A grain separator disposed at the discharge of the threshing cylinder receiving grain, straw and chaff therefrom and separating the grain from the straw and chaff including a perforated auger with rake teeth on the periphery thereof disposed in overlying relation to a grain sieve together with

fans and a collecting pan and auger assembly for the grain and a recleaner which will recirculate a portion of the grain

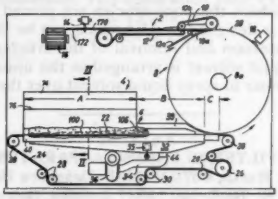


which has been incompletely cleaned to the threshing cylinder.

3,613,692
APPARATUS FOR BUILDING A CONTINUOUS TOBACCO STREAM

Jurgen Gomann, Hamburg-Lohbrugge, Germany, assignor to Hauni-Werke Koerber & Co. K. G., Hamburg, Germany

Filed June 1, 1966, Ser. No. 554,505
Claims priority, application Germany, June 2, 1965, H 56203
Int. Cl. A24c *05/18*
U.S. Cl. 131—84 B **2 Claims**



A tobacco stream is formed by showering tobacco particles into a current of suction air which flows across an elongated stream building zone defined by a channel wherein a foraminous belt travels lengthwise to transport the particles of the resulting growing tobacco stream. The flow of air across the conveyor is throttled by a valve which is adjacent to the conveyor and whose throttling action decreases in the direction of tobacco travel all the way between the ends of the stream building zone.

3,613,693
RECONSTITUTED TOBACCO

Matthew Sallee Monte, Stratford, Conn., assignor to AMF Incorporated

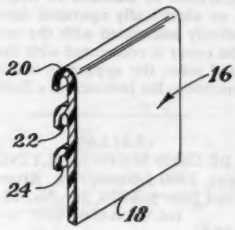
Filed July 24, 1969, Ser. No. 844,631
Int. Cl. A24b *03/14*
U.S. Cl. 131—140 **2 Claims**

A process for manufacturing a reconstituted tobacco composition wherein a foamed slurry is created from tobacco, a foaming agent or adhesive and ethylhydroxyethyl cellulose having an ethoxyl D.S. of 1.2 to 1.6 and a hydroxyethyl M.S. of 0.5 to 1.2. The foamed slurry is shaped while maintaining the temperature thereof below the gelatin temperature of the ethylhydroxyethyl cellulose and dried to form a shaped sheet or rod of predetermined moisture content. The foaming agent employed may be a synthetic or natural gum or water dispersible protein.

3,613,694
GROOMING AID

Jack W. Benjamin, 257-27 149th Road, Rosedale L.I., N.Y.

Filed Jan. 23, 1969, Ser. No. 793,423
Int. Cl. A45d *24/36*
U.S. Cl. 132—45 **3 Claims**

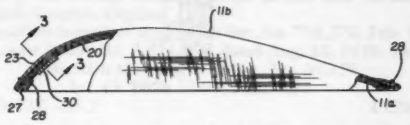


A plate having a guide edge and means for establishing the location of the guide edge in relationship to a fixed reference is provided for cutting sideburns.

3,613,695
HAIRPIECE AND LAMINATED BASE THEREFOR

Ronald S. Kazdin, 4675 Walford Road, Apt. 13, Warrensville Heights, Ohio

Filed Dec. 23, 1968, Ser. No. 786,101
Int. Cl. A41g *3/00*
U.S. Cl. 132—53 **5 Claims**



A base portion for hairpieces or toupees characterized by a laminated construction of plastic layers that provide a maximum of flexibility while retaining the originally formed contour of the base.

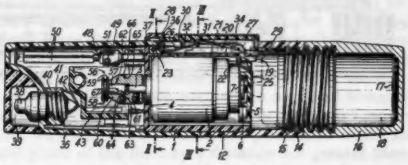
The base is additionally characterized by the use of layers of various colored plastic in the laminate for aesthetic purposes with alternate layers being of different characteristics so as to give the overall completed product a distinct and unique appearance.

It is also contemplated to further improve the unit by a new and unique method of tying the hair strands in place so as to permit the same to be combed in any direction.

3,613,696
ELECTRICAL MANICURING APPARATUS

Kurt Paule, Stuttgart-Obertuerkheim; Fritz Schadlich, Stetten A. F., and Alfred Hettich, Echterdingen, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

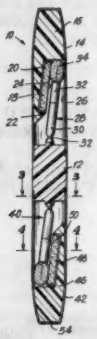
Filed July 31, 1969, Ser. No. 846,447
Claims priority, application Germany, Sept. 20, 1968, P 17 82 586.4
Int. Cl. A45d *29/05*
U.S. Cl. 132—73.6 **17 Claims**



An electrical manicuring apparatus comprises a housing and a cover detachably connectable to the housing for

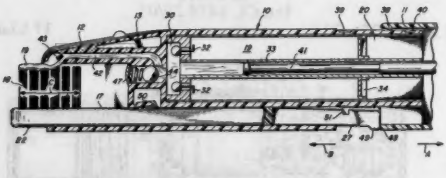
closing an open end of the latter. A motor is arranged in the housing and receives its energy from a self-contained source of electrical energy. A plurality of manicuring tools are removably received in the cover and can be selectively connected with the output shaft of the motor when the cover is removed so that the device can then be used as a manicuring apparatus. In addition to this, the apparatus is provided with an electrically operated device on the cover which is operatively associated with the source of electrical energy when the cover is connected with the housing so that, in this connected state, the apparatus is usable for purposes other than manicuring, for instance as a flashlight or the like.

3,613,697
DEVICE TO BE USED WHEN APPLYING A COSMETIC
Maurice Andrews, 2400 Johnson Ave., Riverdale, N.Y.
Filed June 9, 1970, Ser. No. 45,093
Int. Cl. A45d *40/00*
U.S. Cl. 132—79 C **12 Claims**



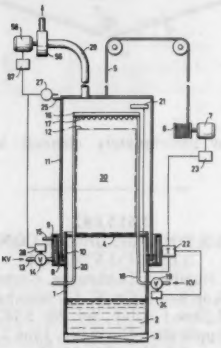
A device to be used when applying a cosmetic. The device has a base and a removable hollow tubular cover carried thereby. The base and the cover coact to compel the cover to move longitudinally onto and off from the base. A support in the hollow interior of the cover supports therein a body of cosmetic material having an exposed surface which extends generally longitudinally of the cover. A cosmetic applicator is carried by the base and extends into the cover in engagement with the body of cosmetic material when the cover is in its closed position on the base. As a result the movement of the cover onto and off from the base result in frictional rubbing of the cosmetic applicator with respect to the body of cosmetic material, so that whenever the cover is removed there will automatically be on the applicator an amount of cosmetic suitable for application.

3,613,698
DENTAL HYGIENE UNIT
Daniel W. Fox, 2108 West Northview Ave., Phoenix, Ariz.
Filed Sept. 26, 1969, Ser. No. 861,438
Int. Cl. A45d *44/18*
U.S. Cl. 132—84 **6 Claims**



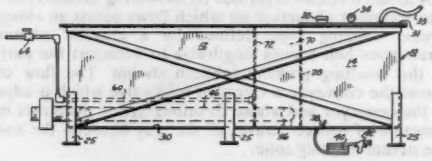
An inclusive dental hygiene unit adapted to be carried on one's person. Within the compact case is a toothbrush and a replaceable disposable dispenser of paste dentifrice. A sliding action of the case end deposits a measured amount of the dentifrice upon the bristles of the toothbrush and simultaneously ejects the upper portion of the brush into usable position.

3,613,699
APPARATUS FOR DEGREASING OBJECTS BY MEANS OF A SOLVENT
Kur Anders Holm, Skoghall, Sweden, assignor to Uddeholms Aktiebolag, Uddeholm, Sweden
Filed July 29, 1969, Ser. No. 845,751
Claims priority, application Sweden, Feb. 4, 1969, 1486/69
Int. Cl. B01d *3/00*
U.S. Cl. 134—57 R **16 Claims**



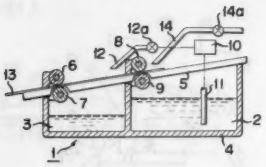
An apparatus for removing grease, oil and fat from articles consists of means for boiling a solvent so that the vapor fills a chamber in which the cool articles are placed. The wall of the chamber is designed as a lid which can be lifted for facilitating the insertion and removal of the articles. A spraying means for liquid solvent is arranged in the upper part of the treating chamber to spray liquid solvent over the articles.

3,613,700
FILTER CLEANING APPARATUS
Lawrence A. Werth, 6070 Hubbell, Dearborn Heights, Mich., and David W. De Remo, 14047 Artisian, Detroit, Mich.
Filed Dec. 15, 1969, Ser. No. 885,082
Int. Cl. B08b *3/02, 3/08, 3/10*
U.S. Cl. 134—57 R **9 Claims**



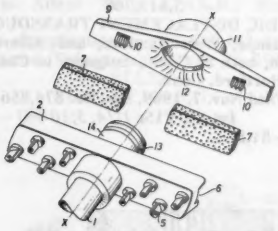
An apparatus for cleaning filters and the like having a pair of containers in a side-by-side relationship, one of the containers having a liquid solvent heated to a predetermined temperature for cleaning filters submerged therein; the other container being a storage tank adapted to dispense a pressurized solution for spray rinsing the cleaned filters; the two containers having a common partition adapted to transfer heat from the liquid solvent holding container to the storage tank for maintaining the temperature of the rinsing solution at a value less than the predetermined temperature of the liquid solvent. In a second embodiment, a dip rinse container is disposed intermediate the liquid solvent holding container and the storage tank, the dip rinse container and the storage tank having the common partition for the transfer of heat to the storage tank while the liquid solvent holding container and the dip rinsing container utilize a common heating means.

3,613,701
DEVICE FOR CLEANING DEVELOPED ELECTROSTATIC PHOTOGRAPHIC COPY SHEET
Sadanao Ando, Tokyo, Japan, assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan
Filed May 14, 1969, Ser. No. 824,417
Claims priority, application Japan, May 17, 1968, 43/33225
Int. Cl. B08b *1/02*
U.S. Cl. 134—64 7 Claims



A device for cleaning excess toner from an electrostatic photographic copy sheet that is advanced on an upward incline over a supply chamber that discharges cleaning liquid over the copy sheet to be collected in a storage chamber. Rollers are provided to advance the copy sheet, and the rollers act as a weir to retard the liquid flow and improve the cleaning.

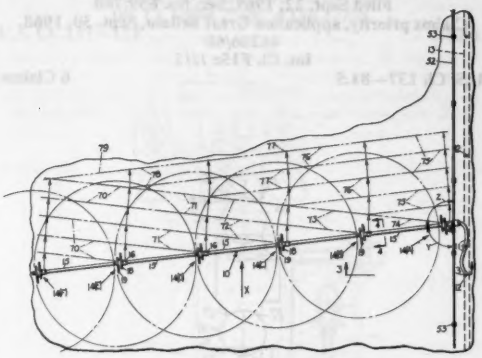
3,613,702
UMBRELLA HAVING A FLAT CROSS-SECTIONAL SHAPE IN CLOSED CONDITION THEREOF
Heinz Weber, Hilden, Rhineland, Germany, assignor to Bremskey & Co., Solingen-Ohligs, Germany
Continuation-in-part of application Ser. No. 748,661, July 30, 1968, now abandoned. This application June 11, 1970, Ser. No. 45,338
Int. Cl. A45b *25/10*
U.S. Cl. 135—20 15 Claims



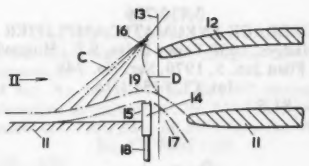
Umbrella having a flat cross-sectional shape in closed condition thereof includes an umbrella stick, a relatively flat crown mounted at one end of the stick, roof-supporting ribs articulatingly connected to the crown, a relatively flat cap carried by the crown, a portion of an umbrella roof covering disposed between the crown and the cap, and means for clamping the crown and the cap together with the roof covering therebetween so as to form lock the crown and cap against rotation with respect to the axis of the stick and force lock the crown and cap against displacement along the axis of the stick.

3,613,703
MOVING IRRIGATION SYSTEM
William H. Stout, 223 N. Jessup St., Portland, Oreg.
Filed Dec. 22, 1969, Ser. No. 886,816
Int. Cl. E03b *1/00*; F17d *1/00*
U.S. Cl. 137—1 5 Claims

A composite, mobile, laterally moving sprinkling pipeline so arranged and controlled that each end of the composite line alternately can be caused to travel a predetermined distance along an arcuate path with the opposite end of the composite line temporarily being substantially at the center of curvature of such arcuate path and with the entire line thus swinging forwardly in alternate angular direction, the composite pipeline being flexible and comprising connected sections with each section automatically moving to maintain alignment with an adjacent section during line travel.



3,613,704
AIRCRAFT ENGINE INTAKE STRUCTURES
Eustace Laurence Goldsmith, Harrold, England, assignor to Minister of Technology in Her Britannic Majesty's Government of the United States of Great Britain and Northern Ireland, London, England
Continuation-in-part of application Ser. No. 705,370, Feb. 14, 1968, now Patent No. 3,524,458, dated Aug. 18, 1970. This application May 11, 1970, Ser. No. 36,255
Int. Cl. F02b *27/00*; F02c *7/04*
U.S. Cl. 137—15.2 1 Claim



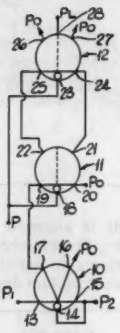
Application Ser. No. 705,370 filed on Feb. 14, 1968—now U.S. Pat. No. 3,524,458 issued Aug. 18, 1970—describes an invention relating to fluid flow intake ducts particularly for aircraft engines for aircraft required to operate throughout a speed range embracing both subsonic and supersonic speeds. According to the earlier invention an intake duct has a bluff forward facing wall or step movable transversely across the duct to deflect the boundary layer from an aerodynamic surface forward of said wall, said surface comprising for example part of the intake or the surface of a centerbody extending forward from the duct, and having a bleed aperture extending through the wall of the duct downstream of said movable wall through which some at least of the deflected boundary layer which passes over said movable wall flows away from the free mass of fluid flowing through the duct downstream of said wall. According to the present invention in a fluid flow intake duct of the type having, forward of the duct, structure over which air flows towards the duct at least when the duct mounting is in forward motion, a movable wall has its upstream face positioned upstream of the inlet plane of the duct by a distance not greater than the maximum transverse distance between the structure and a corresponding leading edge of the duct. Preferably the distance between the upstream face and the inlet plane is 0.25 said maximum transverse distance.

3,613,705

FLUIDIC SWITCHING CIRCUITS

Ronald Alfred Heath, Harborne, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Sept. 22, 1969, Ser. No. 859,740
Claims priority, application Great Britain, Sept. 30, 1968, 46266/68
Int. Cl. F15c 1/12
U.S. Cl. 137—81.5 6 Claims



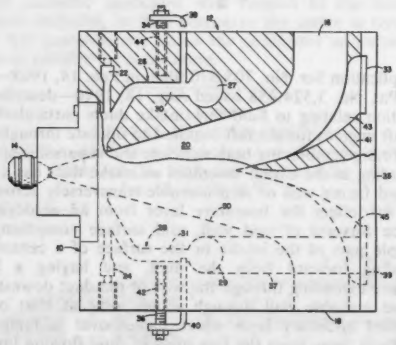
The invention relates to a fluid pressure-ratio switching circuit which provides an output only when one of a pair of independent control signals is greater than the other. Switching is effected in a bistable fluidic device, one or both of the outputs of which are used to provide control signals for two subsequent stages of amplification. Amplification is effected by a pair of fluidic proportional amplifier devices, the arrangement being that the circuit output is taken from the vent port of the final amplifier device.

3,613,706

FEEDBACK PNEUMATIC AMPLIFIER

William H. Hodges, 1038 Toney Drive, S.E., Huntsville, Ala.

Filed Jan. 5, 1970, Ser. No. 748
Int. Cl. F15c 1/16
U.S. Cl. 137—81.5 3 Claims



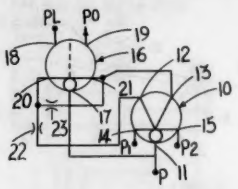
A fluid amplifier having mechanism for providing increased gain in amplification. The mechanism includes feedback means interposed between the output and control ports of the amplifier. The feedback means is provided with adjustable gates and to obtain maximum gain, the feedback is adjusted to a point slightly below that required for oscillation, for any selected main supply flow. At this point the mass flow of gas, through the control ports, which is necessary to cause the amplifier to switch is very small.

3,613,707

FLUIDIC SWITCHING CIRCUITS

Ronald Alfred Heath, Harborne, Birmingham, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Sept. 17, 1969, Ser. No. 860,165
Claims priority, application Great Britain, Sept. 30, 1968, 46264/68
Int. Cl. F15c 1/12
U.S. Cl. 137—81.5 13 Claims



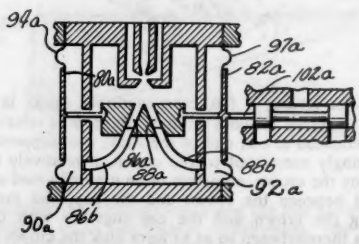
The invention relates to a fluidic pressure-ratio switching system, which gives an output pressure signal when one control pressure is higher than another in which the output pressure is a high of an input pressure which is used to drive the system. A fluidic bistable device performs the switching function and a fluidic proportional amplifier provides the pressure recovery, the outputs of the bistable device being used to provide control pressures for the proportional amplifier. A flow restrictor is connected in one output of the bistable device and a further flow restrictor is connected between the proportional amplifier control connections. A predetermined pressure ratio therefore exists between these control connections. In order to prevent feedback of pressure from the proportional amplifier to the bistable device a further bistable device may be connected in each line between the switching bistable and the amplifier. Alternatively, a monostable device may be connected in one of the lines and the other of the lines exhausted to atmosphere.

3,613,708

FLUIDIC DISPLACEMENT TRANSDUCER

Robert F. Kampe, West Hartford, and Albert H. White, Wethersfield, both of Conn., assignors to Chandler Evans Inc., West Hartford, Conn.

Filed Nov. 7, 1969, Ser. No. 874,856
Int. Cl. F15c 1/14, 3/10
U.S. Cl. 137—81.5 2 Claims



A fluid amplifier is provided with pressure surfaces which are movable in response to the pressure differential between two opposed chambers. A power stream impinges on a splitter element which separates two channels which respectively communicate with the chambers, so that a control stream may direct the power stream into either channel and create a pressure differential between the chambers. When the pressure surfaces move, the splitter element again impinges on the power stream annulling the initial pressure differential. Either the splitting element or the orifice of the power stream is connected to the pressure surfaces so as to be movable therewith to change the relative location of the splitter element and orifice. The amplifier

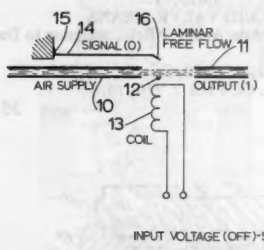
may be employed as either a position or force to pressure transducer or a pressure to position or force transducer. A fluidic closed-loop pneumatic actuation system incorporates the amplifier to position a servovalve controlled actuator.

3,613,709

ELECTRIC TO FLUIDIC SIGNAL TRANSDUCER

Paul M. Blaiklock, Newton Center, Mass., assignor to The Foxboro Company, Foxboro, Mass.

Filed Feb. 19, 1970, Ser. No. 12,558
Int. Cl. F15c *1/18*
U.S. Cl. 137—81.5 1 Claim



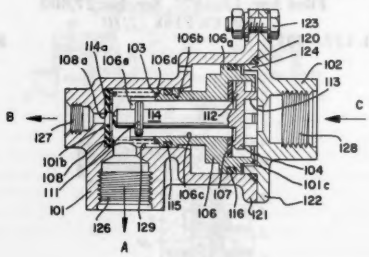
A fluidic diffusion amplifier. An electromagnetic reed flexibly mounted for movement into diffusing contact with a laminar fluid stream in the flow path of the diffusion amplifier. An electromagnetic coil for receiving an electrical signal to produce a magnetic field in the area of the reed, to cause the movement of the reed into the flow path of the diffusion amplifier. An electrical input signal to the coil causes a logic output change in the diffusion amplifier.

3,613,710

SWITCHOVER VALVE FOR PNEUMATIC INSTALLATIONS

Heinrich Oberthur, Offenbach-Rumpenheim, Germany, assignor to Alfred Teves G.m.b.H., Frankfurt/Main, Germany

Continuation of application Ser. No. 668,462, Sept. 18, 1967, now abandoned. This application Nov. 26, 1969, Ser. No. 873,746
Int. Cl. F16k *15/14*
U.S. Cl. 137—102 6 Claims



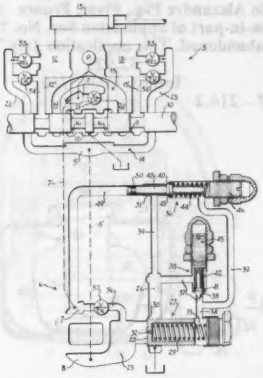
A fluid-operated switchover valve having an outlet communicating with a gas chamber (e.g. of a charging cylinder for a hydrodynamic brake system), a first inlet communicating with a source of gas (e.g. an air pressure tank or the atmosphere) and another control inlet subjected to reduced pressure (e.g. from a suction reservoir), the valve having a housing forming an elongated bore for a valve piston bearing against a spring with the pressure of the first inlet and a valve member slidable in the piston and cooperating therewith to form a valve with alternatively connects the suction inlet and the air inlet with the chamber.

3,613,711

FLUID MOTOR CONTROL MECHANISM

Raud A. Wilke, Brookfield, Wis., assignor to Koehring Company, Milwaukee, Wis.

Filed Dec. 23, 1969, Ser. No. 887,480
Int. Cl. G05d *11/00*; F15b *11/08*
U.S. Cl. 137—115 7 Claims



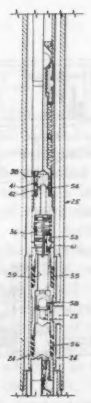
A normally closed pilot controllable exhaust valve mechanism governs the discharge of return fluid from the exhaust passage of a fluid motor control mechanism. A first pilot instrumentality effects opening of the exhaust valve mechanism in consequence of rise in pressure of fluid in the exhaust passage to a predetermined value. A second pilot instrumentality effects opening of the exhaust valve mechanism at times when the pressure of fluid in a source connected supply fluid passage rises to a predetermined value exceeding the first, to assure that there will be substantially no obstruction to discharge of exhaust fluid from the exhaust passage at times when a hydraulic motor governed by the control mechanism is under heavy load.

3,613,712

GAS LIFT VALVE AND SYSTEM

Henry U. Garrett, Houston, Tex., assignor to Udell Garrett, Inc., Houston, Tex.

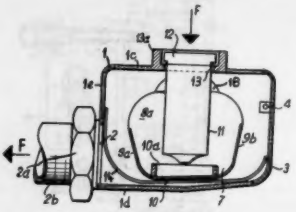
Division of Ser. No. 822,911, May 8, 1969, abandoned, which is a continuation-in-part of Ser. No. 819,608, Apr. 28, 1969, abandoned. Filed June 24, 1970, Ser. No. 49,463
Int. Cl. F04f *1/08*
U.S. Cl. 137—155 4 Claims



This patent discloses a system for gas lift of petroleum wells in which when the well is shut-in, the formation liquid

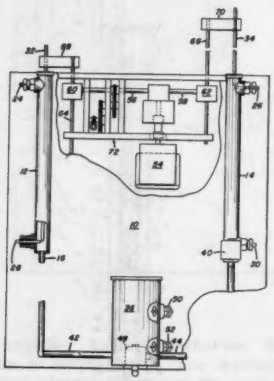
will not rise above a selected level in the tubing. The patent also discloses a gas lift valve in which the bellows is protected against an excess pressure differential thereacross.

3,613,713
SANITARY DRAIN SIPHON
Meneglier G. Gaston, Saint Marcel Les Valence, France, assignor to Alexandre Piq., Pivas, France
Continuation-in-part of application Ser. No. 708,579, Feb. 27, 1968, now abandoned. This application July 7, 1970, Ser. No. 52,921
Int. Cl. E03c 1/10
U.S. Cl. 137—216.2 **16 Claims**



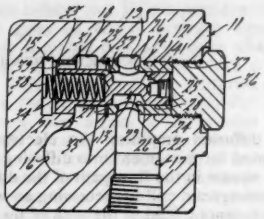
A sanitary siphon providing a gas seal in the drain line of a washbasin, sink or other appliance, has an inlet tube extending down into a collecting vessel which is freely disposed in a casing having an outlet connected to the sewer and is tiltable in one direction from a normal upright position in the casing to empty the vessel and in the opposite direction to provide access through a closable opening in the casing for removal of any solid object that may accidentally have been dropped in the drain. The collecting vessel is tilted by means of an actuating knob connected with the vessel by a cam-actuating mechanism and is guided so as to tilt about a movable axis permitting a large angle of tilt without interference with the inlet tube.

3,613,714
MIXING APPARATUS
Paul B. Frank; Thomas R. Mangan, Sr., and John C. Mcfall, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed June 15, 1970, Ser. No. 46,052
Int. Cl. G05d 9/12
U.S. Cl. 137—263 **9 Claims**



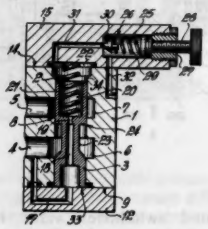
for present invention is directed to a liquid-mixing apparatus comprising a first container and a second container. Means is provided for supplying liquids to the containers with valve means arranged to control the supply of liquid to each of the containers. A liquid-level-sensing means is disposed in each of the containers which is arranged to control the respective valve means. Means is provided to selectively vary the position of each liquid-level-sensing means in the containers whereby the position of the sensing means in the first container is varied directly inversely to the position of the sensing means in the second container. A receiver means is arranged to receive the liquid from the first and second containers. And a control means is operably connected to the liquid-level-sensing means and the valve means whereby a preselected liquid mixture is continuously prepared.

3,613,715
FLUID VALVE MEANS
Charles E. Johnson, Ann Arbor, Mich., assignor to Double A. Products Company
Filed May 1, 1970, Ser. No. 33,783
Int. Cl. F16k 17/10, 15/06
U.S. Cl. 137—269 **35 Claims**



A fluid valve arrangement consisting of three basic elements; a valve housing, a valve sleeve and a valve spool; that may be assembled in a variety of ways to provide several different valve functions. By adding other components to the three basic elements still further valve functions are provided.

3,613,716
PRESSURE-RESPONSIVE CONTROL VALVE
Rainer Hoheisel, Kornwestheim; Berthold Fischer, Nuertingen, and Gunter Ackermann, Stuttgart, all of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany
Filed Apr. 13, 1970, Ser. No. 27,800
Int. Cl. F16k 17/10
U.S. Cl. 137—491 **8 Claims**



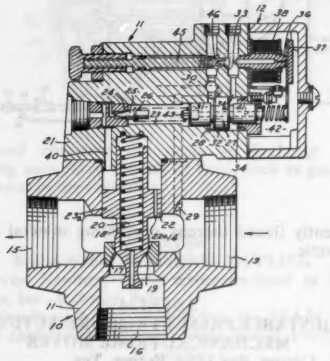
A pressure-responsive control valve has a biased valve slide with a longitudinal duct forming a throttle which connects a pressure conduit with a biased pressure-responsive closure valve so that the valve slide assumes a balanced open position when sufficient pressure is applied to the pressure conduit.

3,613,717

REMOTE ELECTRICALLY MODULATED RELIEF VALVE

Robert Harvey Smith, Warren, Mich., assignor to Sperry Rand Corporation, Troy, Mich.

Filed May 20, 1970, Ser. No. 38,999
Int. Cl. F16k 31/12
U.S. Cl. 137—491 13 Claims



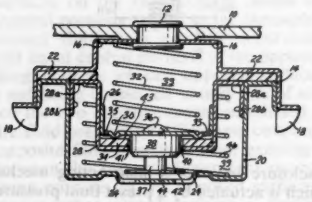
A remote electrically modulated relief valve comprising a main stage valve, a pilot stage valve, and a control stage. The pilot stage is responsive to the pressure through the main stage and includes spring loading operable upon exceeding a predetermined pressure to actuate hydraulically the main stage. The control stage hydraulically varies the spring loading on the pilot stage in accordance with an electrical signal that is supplied thereto to vary the pressure at which the pilot stage will function to operate the main stage.

3,613,718

PRESSURE-VACUUM CONTROL VALVE

J. R. Ballinger, Setauket, N.Y., assignor to All-O-Matic Manufacturing Corporation, New Hyde Park, N.Y.

Filed Dec. 11, 1969, Ser. No. 884,303
Int. Cl. F16k 17/18
U.S. Cl. 137—493 18 Claims



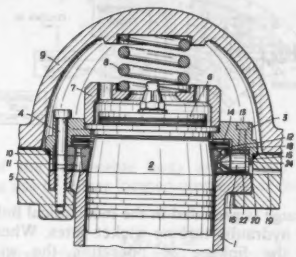
A pressure-vacuum control valve system, particularly for use in sealing hydrocarbon fuel containers, for equalizing the pressure within and without such a container by controlling air and fuel venting, comprises telescoping valve members defining a single seat valve adapted to vent fluid in both directions. A restriction adjacent the single valve seat is adopted to inhibit the venting of large quantities of fuel during short periods of tank pressure increase by lowering the pressure adjacent said valve seat in response to flow through said restriction. A time lag in valve actuation is provided by the free travel of said valve members in at least one direction, said free travel also providing momentum to assist the subsequent valve actuation.

3,613,719

COMPRESSOR VALVE ARRANGEMENT

Friedrich Bauer, Vienna, Austria, assignor to Hoerbiger Ventilwerke Aktiengesellschaft

Filed Oct. 7, 1969, Ser. No. 864,392
Claims priority, application Austria, Oct. 16, 1968, A10129/68
Int. Cl. F16k 15/00
U.S. Cl. 137—522 5 Claims



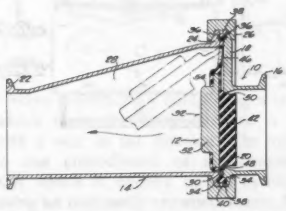
A compressor valve arrangement having a device for regulating delivery quantities and wherein a valve plate can be raised from a valve seat against a closing force by means of control pistons displaceable in cylinder bores in the valve seat.

3,613,720

CHECK VALVE ASSEMBLY

Elmer Scott Welch, Silver Lake, Wis., assignor to G & H Products, Inc., Kenosha, Wis.

Filed Jan. 27, 1969, Ser. No. 794,205
Int. Cl. F16k 15/14
U.S. Cl. 137—527.8 4 Claims



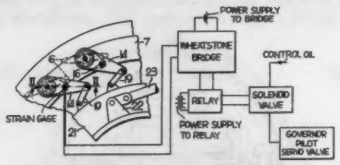
A check valve assembly comprising an inlet body, a valve plug assembly and an eccentric reducing outlet body. The inlet and outlet bodies are removably connected together with the valve plug assembly mounted between the two body portions. The valve plug assembly is preferably of rubber material and is comprised of a circular gasket portion and a centrally disposed flapper valve portion formed integrally with each other. The gasket portion serves to seal the connection between the inlet and outlet bodies, and the flapper valve portion is comprised of a swingable valve member connected to the gasket portion by a pair of hinge portions located at the top portion of the valve member. The inlet body has a seat formed thereon against which the swingable valve member is adapted to seat and thereby block flow from the outlet to the inlet. Such swingable valve member is also adapted to swing upwardly away from the seat to allow flow from the inlet to the outlet. The flapper valve is provided with a metal core member molded into the valve member which serves as a weight to aid in the closing action of the valve.

3,613,721

WICKET GATE OVERLOAD SENSOR AND PROTECTOR

John M. Horn, York, Pa., assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Filed Dec. 17, 1969, Ser. No. 885,847
Int. Cl. F16k *37/00, 31/44*
U.S. Cl. 137—551 3 Claims



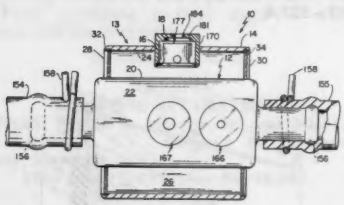
A strain gauge is provided in the mechanical linkage which operates the hydraulic turbine wicket gates. When the force exerted by the linkage in operating the wicket gates approaches that force which will cause the linkage to fail the change of resistance in the strain gauge initiates a signal which either indicates to the operator that the closing operation should be stopped or stops the closing operation automatically.

3,613,722

CONDITIONING FLUIDS

Nathaniel Hughes, Beverly Hills, Calif., assignor to Energy Sciences Incorporated, El Segundo, Calif.

Filed Mar. 9, 1970, Ser. No. 17,484
Int. Cl. B01f *5/02*
U.S. Cl. 137—599 18 Claims



In a fluid-conditioning apparatus having a fluid conditioner, having an axial flow passage between an axial inlet, an axial outlet, a nozzle mounted axially in this flow passage, and a nozzle mounted radially of the flow passage defining a radial inlet to the flow passage, the improvement comprising a fluid preconditioner comprising a structure defining a fluid source in communication with the inlet end of the radially mounted nozzle of the conditioner providing the fluid supply to this nozzle, the source-defining structure having a fluid inlet, and a fluid-supply nozzle mounted in the source inlet to supply fluid therethrough to the source, the fluid supply nozzle comprising a body defining an axial flow passage having inlet and outlet ends and an even plurality of radial orifices into this passage between its ends, with the radial orifices arranged in coaxial pairs 180° apart.

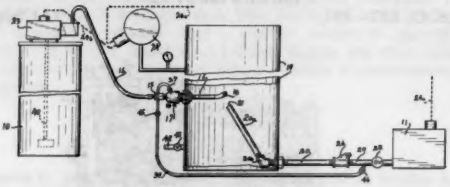
3,613,723

CHLORINE INJECTION MEANS

Max E. Witt, 803 North Renville, Winthrop, Minn.

Filed Feb. 3, 1970, Ser. No. 8,323
Int. Cl. F16k *19/00*
U.S. Cl. 137—604 9 Claims

Apparatus for injecting chlorine into a water system including an elongated injection nozzle composed of a flexible material and angularly positioned with respect to the direction of waterflow or turbulence so that the nozzle is intermittently flexed thereby preventing mineral deposition on the nozzle.

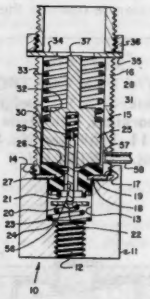


3,613,724

ADJUSTABLE PRESET PRESSURE-ACTUATED MECHANICAL PRIME MOVER

Forrest L. Carson, Box 1594, Borger, Tex.

Continuation-in-part of application Ser. No. 683,293, Nov. 15, 1967, now Patent No. 3,465,647. This application Sept. 8, 1969, Ser. No. 856,139
Int. Cl. F15b *15/22, 13/042*; F01b *11/02*
U.S. Cl. 137—612.1 3 Claims



The disclosure involves a snap acting mechanical prime mover which is actuated by a preset fluid pressure and can be adjusted to be actuated by any desired preset pressure within the range of the prime mover. The prime mover will move outwardly and return when the actuating pressure reaches a preset level. Upon release of the actuating pressure the prime mover resets for another cycle.

3,613,725

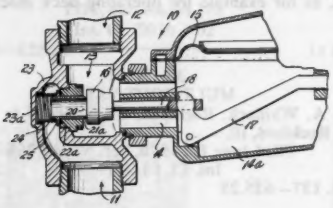
SAFETY CONTROL FOR FLUID PRESSURE REGULATORS

George C. Hughes, Anderson, Ind., assignor to Textron Inc., Providence, R.I.

Filed Jan. 9, 1970, Ser. No. 1,701
Int. Cl. F16k *15/02, 25/00*
U.S. Cl. 137—613 9 Claims

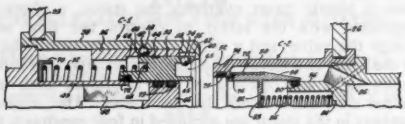
A safety control for fluid pressure regulators having means for restricting high-pressure fluid from flowing downstream in the event that foreign matter or structural defects in the orifice or valve seat of the valve means prevents the valve

from completely sealing off the flow of fluid or locking up under the action of the regulator. Such a safety control will



prevent and eliminate the need to discharge into the surrounding air a large volume of fluid, such as gas, through the usual vent in the regulator.

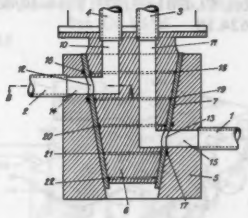
3,613,726
BALANCED PRESSURE COUPLING
Jorge Torres, Newbury Park, Calif., assignor to Purolator Products, Inc., Rahway, N.J.
Continuation-in-part of application Ser. No. 38,634, June 24, 1960, now abandoned. This application Dec. 2, 1965, Ser. No. 517,208
Int. Cl. F16l *37/22*
U.S. Cl. 137—614.03 **19 Claims**



A coupling assembly for releasably interconnecting a first passage means and a second passage means for flow of pressurized fluid between the two passage means, comprising: a first coupling means and a second coupling means for mounting on the ends of said first and second passage means respectively, said two coupling means being adapted to mate to place the two passage means in fluid communication with each other, said two coupling means when mated having opposed surfaces of equal area exposed to the pressure of the confined fluid with equal central portions of said opposed surfaces on the two coupling means respectively with said central portions vented to the atmosphere to keep the pressurized fluid from creating separation pressure between said equal central portions of the opposed surfaces, the remaining portions of said opposed surfaces being of equal area and being connected to only one of said coupling means when the two coupling means are mated to transmit the opposite fluid pressures to the same coupling means to keep the opposite fluid pressures from exerting separation pressure between the two coupling means over the area of said remaining portions of the opposed surfaces, said two coupling means when mated forming a continuous fluid passage in which the direction of flow at the juncture of the two coupling means is perpendicular to the common axis of the two coupling means.

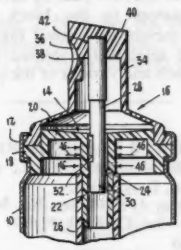
3,613,727
TUBE-CONNECTING DEVICE
Pierre P. Orieux, Paris, France, assignor to Compagnie Francais Des Petroles Societe Anonyme, Paris, France
Filed Aug. 14, 1969, Ser. No. 850,035
Int. Cl. F16k *11/12*
U.S. Cl. 137—614.17 **8 Claims**

A tube-connecting device which can be used to connect or disconnect tubes without requiring the use of auxiliary devices such as valves located upstream and downstream of the connection to stop the flow of liquids through the tubes. The tube-connecting device includes a movable jacket having openings therethrough placed between a fixed body to which is attached a first set of tubes and a removable body to which is attached a second set of tubes. The jacket may be rotated to block the passage of fluid from the fixed body to allow



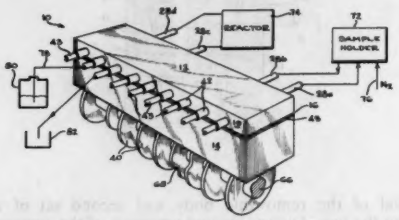
removal of the removable body and second set of tubes without the use of valves located upstream of the connection.

3,613,728
DIAPHRAGM-ACTUATED AEROSOL VALVE
Wolf Steiman, Fairfield, Conn., assignor to Valve Corporation of America, Bridgeport, Conn.
Filed Sept. 29, 1969, Ser. No. 861,697
Int. Cl. B65d *83/14, 39/00*; F16k *21/04*
U.S. Cl. 137—614.19 **13 Claims**



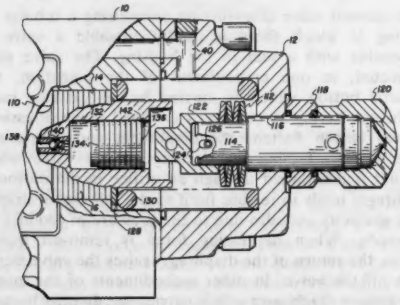
An aerosol valve construction comprising a tubular valve housing in which there is axially movable a valve stem cooperable with a seat in the housing. The valve stem is connected, in one embodiment of the invention, to an actuator button which is carried by an exterior resilient diaphragm having an outwardly crowned shape. Pressing the depress button flattens the diaphragm and depresses the valve stem, effecting an opening of the valve whereby product is discharged through an orifice in the button. The diaphragm tends to restore itself to the full crown shape due to its elasticity and also due to the pressure of product on its underside. When depressing force is removed from the button, the return of the diaphragm raises the valve stem and shuts off the valve. In other embodiments of the invention the resilient diaphragm which carries the depress button has a tubular portion acting as the valve housing and which is provided with a valve seat. The valve stem which extends into the valve housing and which is cooperable with the valve seat, is stationarily mounted. When the depress button is forced downward, flattening the diaphragm, it shifts downward the valve housing (portion of the diaphragm) while the valve stem remains stationary. This results in an opening of the valve. The valve closes when downward force is removed from the button, enabling the diaphragm to raise and restore itself to the original crowned shape or configuration. By use of the resilient crowned diaphragm to restore the valve to the closed position there is not needed the usual helical valve return spring which has been heretofore almost universally used.

3,613,729
VALVE SYSTEM
Ralph A. Dora, Santa Barbara, Calif., assignor to Packard Instrument Company, Inc., Downers Grove, Ill.
Filed Feb. 16, 1970, Ser. No. 11,537
Int. Cl. G01n *31/08*; F16k *19/00*
U.S. Cl. 137—624.18 7 Claims



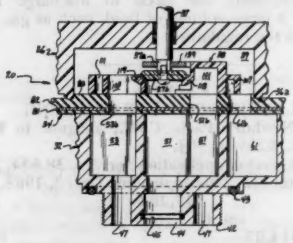
A valve system adapted to automatically add solvents and/or reactants to a sample and a reactor by connecting multiple fluid inlets or outlets to a main flow path has an upper body with an open trough formed in the bottom surface thereof, a flexible, elastically deformable, membrane clamped between the bottom surface of the body and a lower block to close the open trough and provide a longitudinal flow path, and a plurality of ports extending into the body terminating at spaced points on its bottom surface, each port being separated from the flow path by surrounding partitions. Reciprocating actuators in the block below each port normally hold the membrane against the partitions to close the ports, and are selectively released to perit fluid flow between the flow path and various of the ports.

3,613,730
POWER TRANSMISSION
Robert H. Breeden, Metamora, Mich., assignor to Sperry Rand Corporation, Troy, Mich.
Filed May 4, 1970, Ser. No. 34,008
Int. Cl. F16k *11/00*
U.S. Cl. 137—625.6 12 Claims



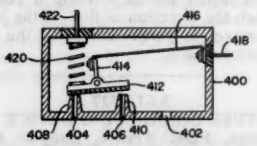
Remote control of a directional control valve in a hydraulic power system is achieved through a pilot control circuit carrying a continuous flow of fluid through a fixed and a variable orifice in series. The variable pressure intermediate the orifices is applied in opposition to a spring system for achieving precise degree of opening of the directional valve and thus modulating the flow therethrough. The spring system achieves a fine and a coarse control of the output flow through the use of a high rate spring effective during initial opening travel of the valve. A flow rate limiter responsive to the pressure drop across an orifice in the main return flow line acts when this pressure drop becomes too high to override the remote control system and shift the main valve toward closed position. The control system is especially useful in hydraulic systems having a central power supply operating at a constant pressure to make fluid available selectively to any of a number of independent hydraulic motors, as for example for operating deck machinery on a ship.

3,613,731
MULTIPORT VALVE
Robert A. Whitlock, Rockford, Ill., assignor to AquaMatic, Inc., Rockford, Ill.
Filed June 12, 1970, Ser. No. 45,708
Int. Cl. F16k *11/02*
U.S. Cl. 137—625.29 18 Claims



The valve is of the lift-turn type and includes a plastic stator, a plastic cover overlying the stator, a plastic rotor cooperable with the stator to control the flow of fluid through the valve, and a resilient gasket between the stator and the rotor and cover. The stator is arranged for mounting directly in a top opening of the treatment tank and all external connections are to the stator. The major flow chambers in the stator are arranged in four quadrants thereof and the flow ports at the inner face of the valve all lie within an imaginary circle having its center at the center of rotation of the rotor, Smaller auxiliary ports are located radially outwardly of the imaginary circle for controlling brining, refill of the brine tank, and one or more service valves, if used. The same channel in the rotor which interconnects the auxiliary ports for the brining operation is also utilized for interconnecting two auxiliary ports during service to relieve the service valve connection to drain.

3,613,732
TEMPERATURE-RESPONSIVE VALVE OPERATORS
James R. Willson, Garden Grove; Keith T. Krueger, Garden Grove; Hugh J. Tyler, Santa Ana, and Wilbur F. Jackson, Rolling Hills, all of Calif., assignors to Robertshaw Controls Company, Richmond, Va.
Filed July 17, 1969, Ser. No. 842,483
Int. Cl. F16k *31/00*; F03g *7/06*
U.S. Cl. 137—625.44 62 Claims

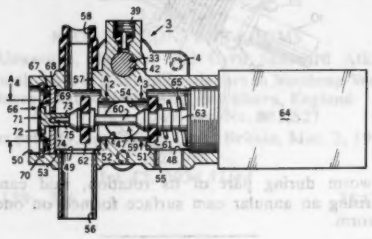


Temperature-responsive valve operators including a control member controlling the position of a valve member and constructed of a material having a temperature-actuated shape memory, the control member having an initial shape and a distorted shape, bias means biasing the valve member into a first position when the control member has the distorted shape, and temperature-controlling means for reverting the control member to the initial shape to move the valve member to a second position.

3,613,733
ANTISKID MECHANISM

John A. Machek, 11803 Spruce Haven, Creve Coeur, Mo.

Division of Ser. No. 823,087, May 8, 1969. Filed Aug. 17, 1970, Ser. No. 64,195
Int. Cl. E03b 1/02
U.S. Cl. 137—625.65 11 Claims

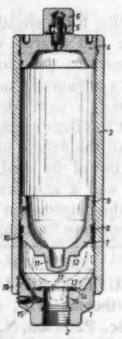


An antiskid device is provided with a control valve actuated in response to signals from a sensing mechanism of impending vehicle skid conditions to respectively subject a control member to atmosphere and selectively subject said control member to vacuum for controlling the application of supplied fluid pressure to the vehicle brakes, and a resiliently urged member is provided for disabling said control member in the event the vacuum is lost.

3,613,734
HYDRAULIC ACCUMULATOR WITH FLOATING PISTON

Adam Elmer, Charlottenstr. 87, 4 Dusseldorf, Germany

Filed Sept. 25, 1969, Ser. No. 860,909
Claims priority, application Germany, Oct. 18, 1968, P 18 03 849.8
Int. Cl. F16l 55/04
U.S. Cl. 138—31 4 Claims

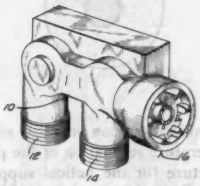


A hydraulic accumulator cylinder encloses an elastically compressible and expansible gas cushion separated from the hydraulic fluid by a floating piston having sealing and guiding rings. The cylinder has one end wall formed with a substantially central hydraulic fluid inlet and outlet opening, the inner surface of this one end wall defining a bowl shape concavity. An additional ring on the piston constitutes a dirt stripper, and the face of the piston toward the one cylinder end wall is formed with a frustoconical protrusion which, when the maximum amount of fluid has been withdrawn from the cylinder, enters the opening. The piston is formed with an annular bearing surface around the protrusion and engageable with a stationary sealing ring on a countersurface in the concavity, the sealing ring acting as a seal only when the piston is pressed against the countersurface by the gas pressure. In this position of the piston, the piston and the one cylinder end wall define an annular chamber in which there remains a residual amount of fluid serving as a liquid barrier against the gas enclosed in the cylinder.

3,613,735
MOUNTING FOR FLOW CONTROL AND OUTLET NIPPLE ON WATER VALVE

Edwin A. Ostrowski, Mount Prospect, Ill., assignor to Controls Company of America, Melrose Park, Ill.

Filed June 25, 1970, Ser. No. 49,763
Int. Cl. F15d
U.S. Cl. 138—45 5 Claims

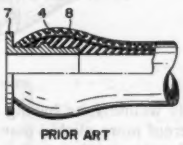


The outlet fitting provides an internal seat for the flow control washer and is retained in the valve body by the splined shear plate which is pressed against the fitting to compress the gasket and then rotated to shear through the internal projections or splines in the body.

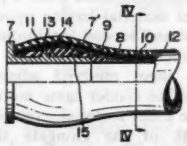
3,613,736
STRANDED WIRE REINFORCED FLUID TRANSPORTING HOSE

Masayoshi Kuwabara, Yokohama, Japan, assignor to Bridgestone Tire Company Limited, Kyobashi, Chuo-ku, Tokyo, Japan

Filed Dec. 2, 1969, Ser. No. 881,468
Claims priority, application Japan, Dec. 4, 1968, 43/105186
Int. Cl. B32b 31/00; F16l 9/00
U.S. Cl. 138—109 3 Claims



PRIOR ART



A stranded wire reinforced fluid-transporting hose comprising a plurality of stranded wires consisting of a plurality of wire elements having its diameter about 0.1 to 0.5 mm. and extending along the axial direction of the hose. One element of the hose is provided with metal flanges at the both ends for series connection. The hose element is particularly suitable in a use of jointing a hose line to a tanker ship or a buoy in a transporting system of fluid, such as oil, by a reason of its high flexibility and its large tensile strength.

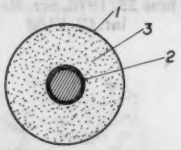
3,613,737
METHOD AND SYSTEM FOR INSULATING PIPES

Werner Peter Schoening, 10906 Green Arbor, Harris, Tex.

Filed Feb. 10, 1969, Ser. No. 797,919
Int. Cl. F161 9/14
U.S. Cl. 138—149 7 Claims

A method and system for insulating pipes comprising a tubular sheath of reinforced plastic film which is supported by a helical wire stiffener which encompasses the pipe. A

space between the sheath and pipe is filled with insulating material. The sections of the sheath correspond to the length of the pipe and can be readily attached to the adjoining



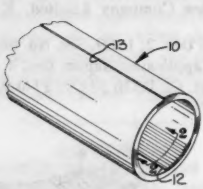
sheath section. This system can be easily adapted to serve the function of temperature regulation of the pipes by employing a hose-type structure for the helical supporting member of the sheath which allows the circulation of liquids.

3,613,738

CONVOLUTELY WOUND TUBE HAVING READILY CONFORMABLE INSIDE EDGE PORTION AND METHOD FOR MAKING SAME

Werner Witzig, Hartsville, S.C., assignor to Sonoco Products Company, Hartsville, S.C.

Filed July 29, 1969, Ser. No. 845,847
Int. Cl. F16l 9/18
U.S. Cl. 138—156 **1 Claim**



A convolutely wound tube having a portion adjacent the inside edge thereof more pliable than the remainder thereof for easily conforming to the contour of the inside surface thereof and method for making same from a predetermined length of elongate sheet material having opposed first and second surfaces and first and second longitudinal side edges, wherein the method includes mechanically deforming a minor portion of the sheet material adjacent the first longitudinal edge thereof to render same more pliable than the major portion of the sheet material, convolutely winding a predetermined length of the elongate sheet material transversely of the length into a convolute tube while forming the inside edge of the tube from the first longitudinal edge of the sheet material so that the pliable portion of the sheet material adjacent the inside edge will readily conform to the contour of the inside surface of the convolute tube, and securing the convolute tube in the wound condition.

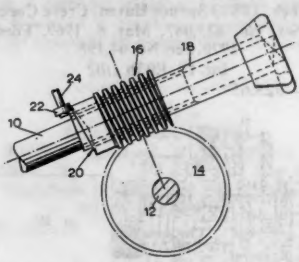
3,613,739

LOOM LETOFF AND TAKEUP MECHANISMS

Cyril M. Atkinson, Carnforth, England, assignor to Northrop Weaving Machinery Limited, Daisyfield, Blackburn, England

Filed Sept. 30, 1969, Ser. No. 862,400
Claims priority, application Great Britain, Oct. 12, 1968, 48,466/68
Int. Cl. D03d 49/00, 49/04
U.S. Cl. 139—1 **7 Claims**

A transmission unit for a loom letoff or takeup mechanism producing an intermittent drive comprises a driving shaft, a worm mounted on said driving shaft for rotation therewith but having freedom for axial movement relatively to said driving shaft, a driven shaft, a worm wheel fixed on said driven shaft for rotation therewith, said worm and said worm wheel being adapted to mesh with one another, and a cam means operative on said worm to cause axial movement of



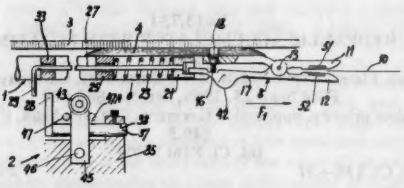
said worm during part of its rotation, said cam means comprising an annular cam surface formed on one end of said worm.

3,613,740

WEFT-PASSING DEVICE FOR A SHUTTLELESS LOOM

Bernard Geiger, Mulhouse, France, assignor to Societe Alsacienne de Constructions Mecaniques de Mulhouse, Mulhouse, France

Filed Dec. 1, 1969, Ser. No. 881,118
Claims priority, application France, Dec. 3, 1968, PV 176,354
Int. Cl. D03d 47/20
U.S. Cl. 139—122 **8 Claims**



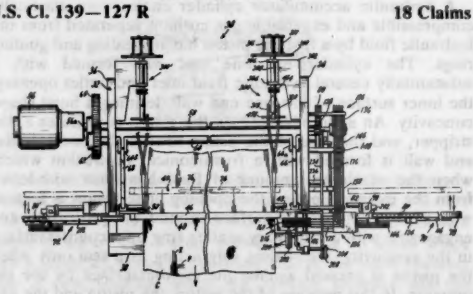
A weft-transfer device for a shuttleless loom comprises a needle having at one end a grab with a fixed jaw and a pivotal jaw spring-urged to the closed position, a spring-loaded sliding catch for engaging a tail on the pivotal jaw and holding the latter open, a cam formation on said tail for engaging an abutment to effect engagement of the catch and tail, upon movement of the needle in one direction and near the end of its passage out of the shed, a projection connected to the sliding catch, and a stop which is engaged by said projection to release the catch when the needle moves in the other direction to its position for catching a weft thread.

3,613,741

SHUTTLELESS LOOM

Arthur Ravella, Hawthorne, N.J., assignor to Boris Kroll Jacquard Looms, Inc., Paterson, N.J.

Filed Jan. 21, 1969, Ser. No. 792,252
Int. Cl. D03d 47/18
U.S. Cl. 139—127 R **18 Claims**



A shuttleless loom having two filling thread carriers which move inwardly from the opposite sides of the weaving section

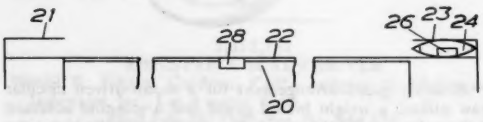
of the loom to a medial filling thread transfer location, with one thread carrier being arranged to pick up a selected filling thread from one of a plurality of a relatively fixed thread supplies and transport the selected filling thread to the medial transfer location and with the other thread carrier being arranged to pick up the filling thread from the first carrier and complete the filling.

3,613,742

STOP MOTIONS FOR LOOMS

David Ainsworth, Darwen, and Cyril Millward Atkinson, Carnforth, both of England, assignors to Northrop Weaving Machinery Limited, Daisyfield, Blackburn, England

Filed Mar. 3, 1969, Ser. No. 803,827
Claims priority, application Great Britain, Mar. 2, 1968, 10273/68
Int. Cl. D03d *51/44*
U.S. Cl. 139—336 **18 Claims**



A loom stop motion to prevent damage to the warp threads or parts of the loom if the shuttle is incorrectly picked, employs a detector 28 midway along the sley a detector 36 associated with the loom crankshaft. The detector 38 signals the passage of the shuttle and the detector 36 signals a time in the loom cycle.

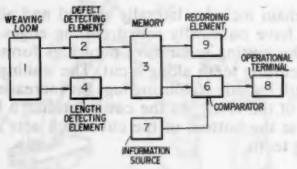
A simple logic circuit is provided, and the pulses from the two detectors are fed into a bistable system A and then to comparators B and C. The pulses from the comparators are fed into a pulse lengthener D, an output amplifier E and into a relay F, the relay F, in turn, controlling a solenoid 162. The solenoid 162 trips the loom stop mechanism and causes the loom to stop. The invention works on the assumption that if the speed of travel of the shuttle is correct, then it will become properly housed in the receiving shuttle box.

3,613,743

METHOD AND APPARATUS FOR PRODUCING FABRICS OF HIGH QUALITY WITH CONSIDERABLY ENHANCED PRODUCTIVITY

Toemon Sakamoto, Hamamatsu-shi, Japan, assignor to Enshu Limited, Kamimura Takatsuka,Hamana-gun,Shizuoka-ken, Japan

Filed Dec. 8, 1969, Ser. No. 883,172
Claims priority, application Japan, Dec. 10, 1968, 43/90483
Int. Cl. D03d *51/18*
U.S. Cl. 139—348 **15 Claims**



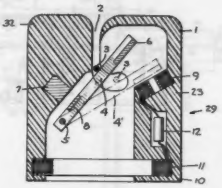
A method and apparatus for carrying out an automatic inspection of fabric quality concurrently with an advancing weaving operation by detecting the formed defect, memorizing the detected results with clear distinction as to kind, total number, formation rate and degree of the defects formed on the fabric, comparing thusly detected results with previously given data and, only when the result is not desirable, stopping the operation of the loom. Memorized results can be used for locating the formed defects in a subsequent defect retrieving process.

3,613,744

WEFT YARN CONTROL APPARATUS

Peter Dosch, Jona; Reinhard Heck, Wattwil, and Ernst Hubeli, Wattwil, all of Switzerland, assignors to Heberlein & Co. AG., Wattwil, Canton of St. Gall, Switzerland

Filed May 15, 1969, Ser. No. 824,812
Claims priority, application Switzerland, May 17, 1968, 7285/68
Int. Cl. D03d *51/34*
U.S. Cl. 139—371 **7 Claims**



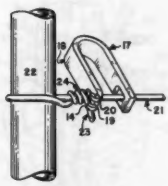
Weft yarn control apparatus for use in a weaving loom and having a signal generator arranged in a shuttle to generate a signal of a given resonance during normal running of the yarn, and to generate a signal of a second resonance upon yarn breakage, the signals being transferred to a receiver inductively coupled with the generator and which, upon receipt of a breakage signal, produces an impulse effective to immobilize the loom.

3,613,745

WIRE WINDING TOOL

Gottlieb H. Treiber, 609 Stephen, P.O. Box 821, Kerrville, Tex.

Filed Apr. 18, 1969, Ser. No. 817,417
Int. Cl. B21f *15/04*
U.S. Cl. 140—118 **1 Claim**



A U-shaped wire winding tool, one arm including a centering slot for engaging the fixed end of the wire, the second arm includes at its end a wire winding slot bracketed by two winding claws, the tool is utilized for attaching a wire to a stationary member or post and for splicing. In operation, the preliminary cut is made and the winding initiated, the tool engages the wire with the winding claws engaging the protruding end, the rotation of the tool produces a secure wind, for splicing the process is repeated on the protruding end of the second wire.

3,613,746

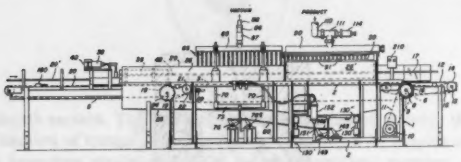
CONTAINER-FILLING APPARATUS AND METHOD

Richard A. Smith, Gibsonia, and Chester L. Gutowski, Pittsburgh, both of Pa., assignors to H. J. Heinz Company, Pittsburgh, Pa.

Filed Nov. 13, 1969, Ser. No. 876,345
Int. Cl. B65b *1/04, 3/04*
U.S. Cl. 141—5 **22 Claims**

This machine for aseptically filling containers, particularly bottles and jars, with sterile, cold, sluggish flowing product, such as ketchup and chili sauce, has parallel conveyors extending through an elongated steam-filled enclosure wherein the bottles, after being preheated, move single file in groups of a specific number, first through an air-purging

section of the enclosure where air is removed therefrom and replaced with steam, after which the group of steam-filled bottles pass into a filling section where the bottles are lifted against filling spouts, and as a product supply valve opens, an initial injection of products into each bottle condenses the steam and the resulting vacuum causes the product to almost instantly fill the bottles, which are then lowered and carried



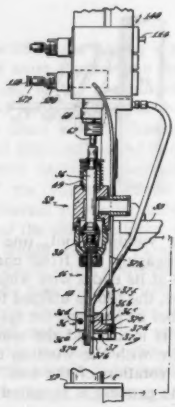
out of the machine while another group enters from the purging section. The operations on one conveyor are 180° out of phase with those on the other, so that while bottles on one conveyor are being purged in one section and filled in the next, purged bottles on the other conveyor are moving into the filling section and the filled bottles are being conveyed out of the filling section.

3,613,747

FILLING HEAD FOR CONTAINER FILLING MACHINE

William H. Trusselle, Braintree, Mass., assignor to Pneumatic Scale Corporation, Quincy, Mass.

Filed Sept. 12, 1969, Ser. No. 857,526
Int. Cl. B67d *5/73;* **B65b** *57/14*
U.S. Cl. 141—198 **1 Claim**



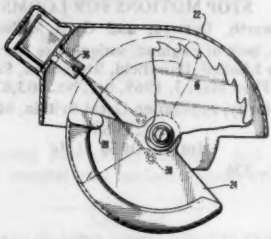
A filling head embodying a chamber to which is connected a conductor for supplying material thereto and a nozzle from which the material delivered to the chamber is adapted to be discharged into a container supported below the nozzle, a pneumatically operable valve in the chamber for controlling the flow of material, an air-conducting tube supported alongside of the nozzle for sensing the rise in level of the material in the container operable when the level reaches a predetermined height to close the valve and adjustable means for supporting the air-conducting tube for movement relative to the nozzle to enable predetermining the level at which the valve will be closed.

3,613,748

SAFETY GUARD ARRANGEMENT FOR CIRCULAR SAW

Dolen A. De Pue, 5109 26th Ave., Washington, D.C.

Filed Sept. 11, 1969, Ser. No. 857,079
Int. Cl. B27b *9/00;* **B27g** *19/04*
U.S. Cl. 143—43 A **2 Claims**



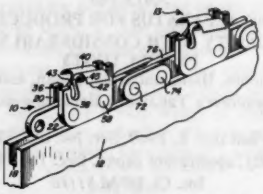
A safety guard arrangement for a motor-driven circular saw utilizes a weight biased guard and a solenoid actuated linkage for moving the guard. The weight normally biases the guard into either a guarding position or a storage position and the guard is moved from one position to another by pulsing of the solenoid. Pulsing of the solenoid is controlled by a switch related to a switch for control of the main motor so that the solenoid is pulsed and the guard moved to the storage position when the motor is started and the solenoid is pulsed and the guard moved back in guarding position when the motor is stopped.

3,613,749

SAW CHAIN WITH DUAL CUTTERS

Grady O. Geurian, 1305 North Front St., Dardanelle, Ark.

Filed Apr. 29, 1970, Ser. No. 32,847
Int. Cl. B27b *33/14*
U.S. Cl. 143—135 R **6 Claims**



A saw chain includes laterally spaced and aligned cutting teeth that have outwardly rolled cutting edges. The leading edges of the cutting teeth have pilot lugs formed therein to guide the cutting teeth along a cut. The trailing edges of the cutting teeth include stabilizing lugs for increasing the cutting efficiency of the teeth. As the cut is formed, a high center is produced at the bottom of the cut which acts as a track for the cutting teeth.

3,613,750

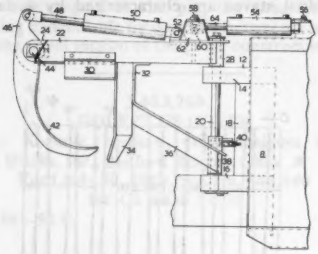
GRAPPLE ATTACHMENT FOR TREE PROCESSORS

William H. Bricknell, Fort William, Ontario, Canada, assignor to Hawker Siddeley Canada Ltd.

Filed Sept. 19, 1969, Ser. No. 859,409
Claims priority, application Canada, July 17, 1969, 057254
Int. Cl. A01g *23/02*
U.S. Cl. 144—3 D **5 Claims**

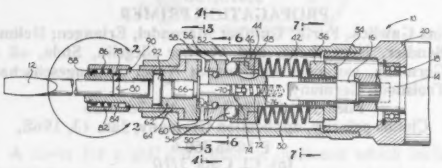
A grapple attachment for tree processors of the linear type. When the nature of a log is such that the processor operator selects it for a saw log, it is passed through a

slashing station until it reaches a substantial length and then is slashed. Instead of being stocked with the normal 8-foot



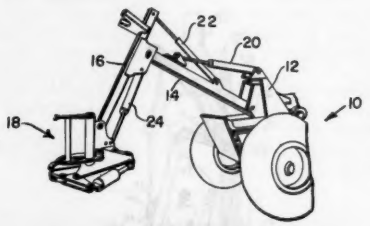
wood, the grapple attachment swings the saw log away from the linear path and releases it.

3,613,751
ADJUSTABLE SCREWDRIVER
Daniel P. Juhasz, Gardena, Calif., assignor to Monogram Industries, Inc., Los Angeles, Calif.
Filed July 24, 1969, Ser. No. 844,428
Int. Cl. B25b *23/14*
U.S. Cl. 144—32 **1 Claim**



An adjustable screwdriver assembly in which an adjustable spring assembly is employed operating upon a ball slip clutch assembly, the spring assembly comprising a plurality of belleville washers. The clutch assembly is connected to a gear transmission unit which in turn is capable of effecting rotation of the screwdriver bit. The screwdriver bit is retained in place by an adjustable ball and groove connection.

3,613,752
CAM AND ROLLER GUIDE MEANS FOR TREE SHEARING BLADES
Earl Crittlon Davis, Jr., Moline, Ill., assignor to Deere & Company, Moline, Ill.
Filed Mar. 28, 1969, Ser. No. 811,536
Int. Cl. A01g *23/02*
U.S. Cl. 144—34 E **9 Claims**

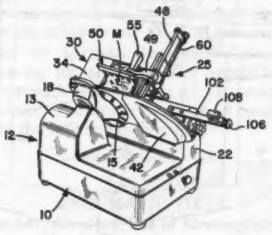


A tree shearing device that includes a shear blade supporting frame, a pair of levers pivotally supported on the frame for swinging movement toward and away from each other, a pair of blades pivotally supported for pivotal movement on the respective levers in a common plane, and cam means on the frame for guiding roller means carried by the blades for causing the blades to shift in a desired pattern in response to swinging the levers.

3,613,753
HOLLOW HAMMER HANDLE WITH LONGITUDINALLY TENSIONED GLASS FIBERS
Wayne Wolf, Cedar Rapids, Iowa, assignor to Vaughan & Bushnell Mfg. Co., Hebron, Ill.
Filed Apr. 21, 1969, Ser. No. 817,805
Int. Cl. B25g *1/10*
U.S. Cl. 145—61 R **5 Claims**

A hollow hammer handle formed of polymerized plastic material with continuous longitudinally tensioned glass fibers extending throughout its length.

3,613,754
FOOD SLICING MACHINE
Richard S. Hartley, Troy, Ohio, assignor to The Hobart Manufacturing Company, Troy, Ohio
Filed Feb. 3, 1970, Ser. No. 8,231
Int. Cl. B26d *1/28, 4/36, 5/42*
U.S. Cl. 146—102 L **8 Claims**

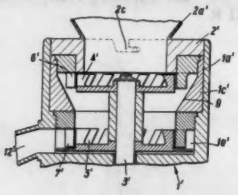


A meat slicing machine has a base which supports an inclined rotary knife and a removable reciprocating carriage having an inclined material supporting surface extending parallel to the axis of the knife. The meat is advanced down the surface by a gripper having a plurality of depending prongs engaging the meat and supported by a pivotable arm slidably mounted on an inclined guide rod. The gripper and arm are fed by a follower engaging an inclined lead screw which is indexed during each return stroke of the carriage by oscillation of a one-way clutch having a finger extending for engagement with an adjustable stop mounted on the base.

3,613,755
APPARATUS FOR FINELY COMMINUTING MEAT OR THE LIKE
Friedrich Otto, Hameln, Germany, assignor to Belder Trust, Reg., Vaduz, Liechtenstein
Filed Mar. 28, 1968, Ser. No. 716,722
Claims priority, application Germany, Nov. 29, 1967, St 27615 III/66b
Int. Cl. B02c *18/06*
U.S. Cl. 146—192 **3 Claims**

Apparatus for comminuting meat comprises a housing in which is journaled a motor-driven shaft supporting two

axially spaced rings of rotary teeth each cooperating with and surrounded by a ring of stationary teeth to comminute meat which is admitted first into the range of one ring of rotary teeth to undergo a coarse comminuting action during passage between the rotary teeth and the teeth of the corresponding



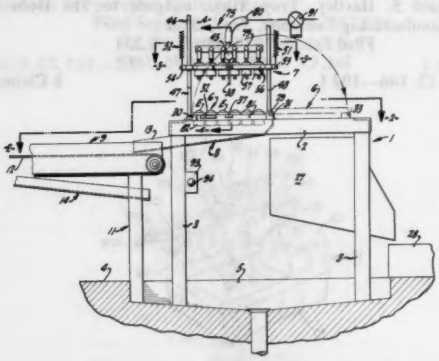
stationary ring. A cylindrical or conical internal surface of the housing guides coarsely comminuted meat into the range of the other rotary ring so that the material undergoes a fine comminuting action during passage between the teeth of the other rotary ring and the teeth of the associated stationary ring.

3,613,756

EGG-SHELLING APPARATUS AND METHOD

Roy C. Snyder, Jr, and Ralph M. Di Tore, both of San Jose, Calif., assignors to Egg Express, Inc., Mountain View, Calif.

Filed Sept. 9, 1968, Ser. No. 758,257
Int. Cl. A47j *19/28*
U.S. Cl. 146—221 **15 Claims**



Apparatus and method for separating the bodies of hard-cooked eggs from their shells. Fluid under pressure is applied against the punctured end of an egg positioned in a restricted passageway having an internal shoulder which precludes passage of an egg in its shell therepast. Fluid introduced into the passageway enters the shell through its punctured end and forces the egg body from the shell and through the restricted end of the passageway. The restricted shoulder precludes movement of the major portion of the shell with the egg body. The membrane which normally surrounds the egg body is separated from the body with the separated shell portion. The invention is usable for shelling single eggs or a plurality thereof simultaneously.

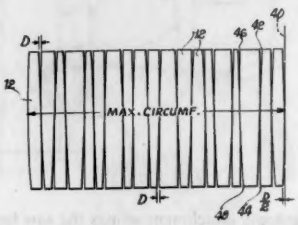
3,613,757

MANUFACTURE OF BARREL CONSTRUCTIONS

David S. Humphrey, 117 Berkeley, Terre Haute, Ind.

Filed Sept. 17, 1970, Ser. No. 73,085
Int. Cl. B27h *5/00*
U.S. Cl. 147—1 **3 Claims**

A system for producing wooden barrel constructions of the type including a plurality of staves assembled in side-by-side relationship with the assembly defining a generally circular cross section. Each stave is provided with a central bilge portion whereby the finished barrel will have a large diameter central portion and smaller diameter end portions. The individual staves are characterized by a narrow end



portion and a wide end portion with the width of the bilge portion exceeding one-half the sum of the widths of the end portions. The staves are assembled in the barrel so that wide and narrow end portions are located at each end of the barrel.

3,613,758

PROPAGATION PRIMER

Heinz Gawlick, Furth; Gunther Marondel, Erlangen; Hellmut Bendler, Nuremberg, and Werner Siegelin, Stein, all of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Filed Jan. 2, 1969, Ser. No. 788,435
Claims priority, application Germany, Jan. 13, 1968, P 16 46 350.6
Int. Cl. C06c *3/10*
U.S. Cl. 149—15 **10 Claims**

A propagation primer containing a primer charge having a composition comprising, by weight, approximately: 40–60 percent of barium nitrate, 10–20 percent of an aluminum-magnesium alloy, 5–20 percent of lead dioxide, 6–10 percent of zirconium hydride, and 1–5 percent of boron. The composition is substantially insensitive to friction and shock. For propagation over larger distances, additional specific primer compositions may be employed.

3,613,759

PURSE-CARRYING STRAP AND FRAME ASSEMBLY

Dana B. Collings, Springfield, and Douglas J. Broughton, Agawam, both of Mass., assignors to Buxton, Incorporated, Agawam, Mass.

Filed Oct. 1, 1969, Ser. No. 862,686
Int. Cl. A45c *1/04*
U.S. Cl. 150—29 **5 Claims**

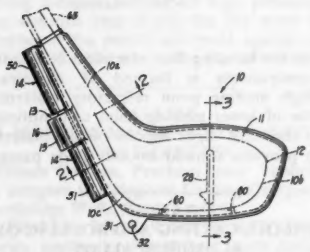
A carrying strap and purse frame assembly having purse frame members pivoted at opposite ends on hinge pin

connections and a strap hung on an anchoring element fitted on one of said pins. In preferred form a French clutch purse structure has a wrist strap anchoring element pivotally mounted with respect to the pin, the strap at the user's option being concealable by inserting between a sidewall and an overlying panel section of the purse construction.

3,613,760
GOLF CLUB COVER

Ronald L. Koehnle, Bedford, Ohio, assignor to Reliable Pattern Works, Inc., Bedford Heights, Ohio

Filed July 30, 1969, Ser. No. 846,140
Int. Cl. A63b *53/00*
U.S. Cl. 150—52 G **15 Claims**

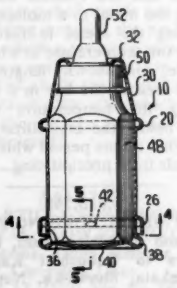


A cover for a golf club head is disclosed which includes first and second cover members for enclosing a head of a golf club. A nonmetallic hinge connects the members together to provide for movement of the members relative to each other for insertion and removal of the golf club head. Nonmetallic spring means urges the cover members together to enclose the golf club head and for maintaining the hinge assembled.

3,613,761
CONTAINER BODY

Elvin C. Moody, Wellington, Ohio, assignor to Forest City Foam Products, Inc., Wellington, Ohio

Filed Aug. 6, 1969, Ser. No. 848,048
Int. Cl. B65d *23/08*
U.S. Cl. 150—52 R **4 Claims**

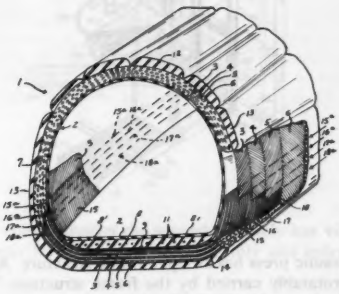


A container body particularly adapted for containing frangible baby bottles and the like, the container body being comprised of two pieces of thermoplastic material manufactured by a novel method and including novel interconnecting means formed upon the two pieces of material.

3,613,762
FABRIC INSERTS FOR FILAMENT WOUND AIRCRAFT TIRES

Theodore J. Reinhart, Jr., 345 Forrer Blvd., Dayton, Ohio

Filed Nov. 26, 1969, Ser. No. 880,002
Int. Cl. B60c *9/06, 15/06*
U.S. Cl. 152—354 **1 Claim**



A filament wound aircraft tire of the toroidal type which includes annular fabric strips positioned between the circular piles of the carcass in the heel or rim area, reinforcing the heel and adjacent rim edge increasing the strength and modulus of the tire carcass in this flexure area, and preventing flexure and compression fatigue failures of the carcass piles in these highly stressed areas.

This invention constitutes an important improvement on my invention disclosed in my (T. J. Reinhart, Jr.) U.S. Pat. No. 3,171,462 for Toroidal Pneumatic Tire, dated Mar. 2, 1965, and having for an object the provision of means to increase the strength and modulus of the toroidal tire carcass in the area of the reinforcing ring or heel bead, adjacent the outer edges of the split rim or wheel.

3,613,763
PNEUMATIC TIRES

Henry R. Fletcher, deceased, late of Birmingham, England (by Agnes Marion Fletcher, legal representative), assignor to Dunlop Holdings Limited

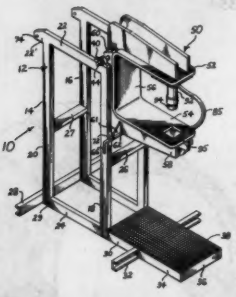
Filed July 16, 1969, Ser. No. 22,717
Claims priority, application Great Britain, July 16, 1968, 33,746/68
Int. Cl. B60c *9/12*
U.S. Cl. 152—359 **16 Claims**

A pneumatic tire comprising at least one fold reinforcement layer e.g. a breaker formed with at least one fold, the layer comprising steel wire cords disposed in parallel side-by-side relationship, the individual wires in the cords having a diameter of substantially 0.003 of an inch or less.

3,613,764
HYDRAULIC PRESS WITH ROTATABLE C-CLAMP HEAD

Edward Franklin Guenard, 741 Strauss St., Kamloops, British Columbia, Canada

Filed Feb. 2, 1970, Ser. No. 7,749
Int. Cl. B60c 25/06
U.S. Cl. 157—1.26 10 Claims

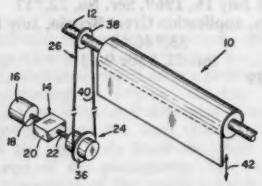


A hydraulic press has an open frame structure. A C-clamp head is rotatably carried by the frame structure. The head has jaws disposable in horizontal position extending forwardly of the frame structure and in vertical position inside the frame structure. One jaw carries a cylindrical ram extending axially between the jaws to press a piece of work disposed therebetween. A hydraulic cylinder carried by the frame is coupled by a flexible hose to the ram. A roller rack can be disposed inside the frame structure for rotatably supporting a tire between the jaws while the ram is operated to break the bead of the tire. A work table can be juxtaposed to the frame structure for supporting a piece of work horizontally while an extension of the ram applies pressure to the piece of work on work table.

3,613,765
FIRE DOOR DROPOUT

Bernard J. Sivin, 15 Byron Road, Commack, N.Y.

Filed Sept. 14, 1970, Ser. No. 72,014
Int. Cl. E05f 15/20
U.S. Cl. 160—1 5 Claims

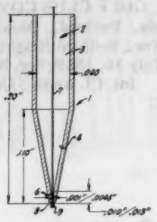


A fusible link dropout or disconnect device for a motor-operated fire door which is advantageously located on the motor shaft and is an integral part of the chain drive by which the motor operator powers the fire door support shaft through rotation to correspondingly urge the fire door through opening and closing movements. The chain drive, consisting of the usual endless loop of chain entrained about spaced-apart sprockets, functions effectively while permitting a degree of lateral shifting movement of the dropout which is utilized as the disconnecting movement thereof in the event of a fire.

3,613,766
METHOD OF MANUFACTURING WELD TIP GUIDE

Robert A. Holzl, La Canada, and William D. Koenig, Sylmar, both of Calif., assignors to Fansteel Inc., North Chicago, Ill.

Division of Ser. No. 542,070, June 7, 1965, Pat. No. 3,472,443.
Filed Jan. 15, 1969, Ser. No. 813,351
Int. Cl. B23k 19/00; B22d 23/00
U.S. Cl. 164—46 6 Claims

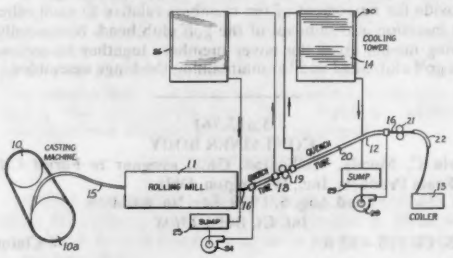


A weld tip for bonding fine electrical conductor wire to electrical components is formed of chemically vapor deposited high melting point refractory material, such as tungsten, free of lower melting point cementitious bonding material, by chemical vapor deposit of said material about a mold which provides a mold smooth guide passage for the wire.

3,613,767
CONTINUOUS CASTING AND ROLLING OF 6201 ALUMINUM ALLOY

Daniel B. Cofer, Carrollton, and Joseph A. Bass, Bremen, both of Ga., assignors to Southwire Company, Carrollton, Ga.

Filed May 13, 1969, Ser. No. 824,220
Int. Cl. B22d 11/12
U.S. Cl. 164—76 2 Claims



A method of continuously manufacturing a heat treatable aluminum base alloy rod, such as 6201 aluminum alloy rod containing from 0.50 to 0.9 percent silicon, from 0.6 to 0.9 percent magnesium and the balance essentially aluminum, comprising heating the metal to a molten state, continuously pouring and cooling the metal to form a cast bar at a temperature above the temperature at which the alloy metals begin to precipitate, continuously lengthening and reducing the cross-sectional area of the bar in a rolling mill to form rod and reducing the temperature of the rod to a temperature level below the crystallization temperature of the alloy metals within a time period which is short enough to keep the alloy metals from precipitating.

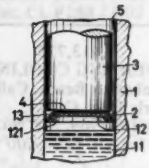
3,613,768
LIQUID METAL FORGING PROCESS

Taikichi Awano, and Yoshihiro Oishi, both of Nagoya-shi, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Hisakata, Showa-ku, Nagoya-shi, Aichi-ken, Japan

Filed Jan. 24, 1969, Ser. No. 793,757
Claims priority, application Japan, Jan. 31, 1968, 43/6129
Int. Cl. B22d 27/12
U.S. Cl. 164—120 2 Claims

Liquid metal forging process comprising pouring liquid metal into a mold, applying high pressure by a punch to said

liquid metal through a sealing member of thin plate interposed between the pressure-applying surface of said punch and the liquid metal, wherein during pressing the rim

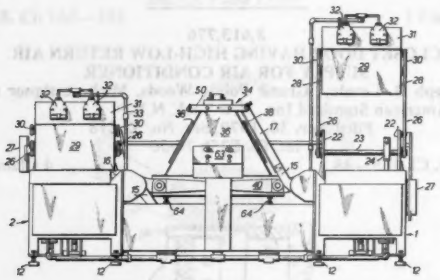


of said sealing member because of high pressure and high temperature deforms and closely fits the mold to seal the clearance between the punch and mold against entrance of said liquid metal, thereby preventing the formation of flash.

3,613,769
SHELL-MOLDING MACHINE WITH PIVOTABLE INVESTMENT BIN

Kenneth William Cowlam, Pembury, near Tunbridge Wells, England, assignor to Polygram Casting Company Limited, Frant, Tunbridge Wells, Kent, England

Filed May 26, 1969, Ser. No. 827,719
Claims priority, application Republic of South Africa, June 19, 1968, 68/3919
Int. Cl. B22c *13/08*
U.S. Cl. 164—166 **6 Claims**



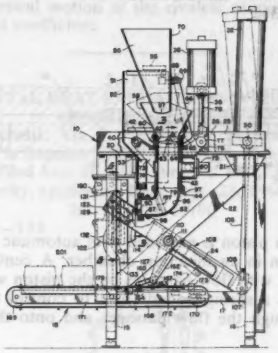
A machine for making shell molds has an investment bin for holding shell-molding material, the bin having openings in its sidewalls against which a pivotally mounted pattern plate can be locked. Once a pattern plate is in position, the plate and the bin are rocked about the pivotal axis of the pattern plate to invest the pattern plate after which the invested plate is swung away from the pin to a position in which curing of the investment is completed.

3,613,770
FOUNDRY SAND ARTICLE FORMING MACHINE WITH PIVOTAL BLOW RESERVOIR

Gilbert J. Janke, Parma, Ohio, assignor to The Sherwin-Williams Company, Cleveland, Ohio

Filed Feb. 12, 1970, Ser. No. 10,768
Int. Cl. B22c *15/24*
U.S. Cl. 164—192 **28 Claims**

A machine for the production of foundry sand articles including a first piston-cylinder assembly for forming a box, a second such assembly for filling a reservoir with molding sand and clamping such reservoir laterally against such box for the sand to be blown therein, the first assembly disassembling such box and stripping the sand article therein onto a

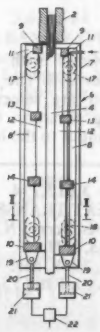


discharge conveyor after the second assembly has withdrawn the reservoir for filling, the first assembly also indexing the conveyor.

3,613,771
OPEN-ENDED MOLD-CASTING APPARATUS

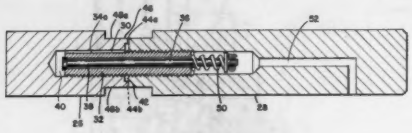
Hans Bieri, Oberrick, Switzerland, assignor to Erik Olsson A.G., Zurich, Switzerland

Filed Feb. 26, 1969, Ser. No. 802,478
Claims priority, application Switzerland, Mar. 1, 1968, 3151/68
Int. Cl. B22d *11/12*
U.S. Cl. 164—282 **15 Claims**



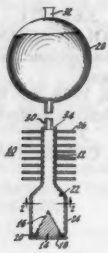
There is disclosed metal casting apparatus of the type in which molten metal entering the top of an open-ended mold emerges from the bottom as a strand having an outer skin or shell and a molten interior, and the invention relates to supports for the strand as it leaves the mold and solidification progresses. This support comprises opposed supporting frames between which the strand is confined, and one or both of them moves up and down relative to the other and relative to the axis of the strand, the motion being either rectilineal or oscillatory. The frequency of the up and down cycle and its amplitude control the rate of travel of the strand.

3,613,772
INJECTION PISTON FOR DIECASTING
Irving A. Carr, 60 Gardner St., Hingham, Mass.
Filed Dec. 27, 1968, Ser. No. 787,353
Int. Cl. B22d 17/08
U.S. Cl. 164—312 10 Claims



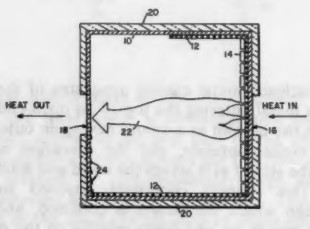
An injection piston is provided with automatic lubrication at any location in an injection chamber. A central conduit communicates with flow passages on the piston wall. Within the conduit is a spring-loaded valve to control the flow of lubricant through the flow passages and onto the chamber wall.

3,613,773
CONSTANT TEMPERATURE OUTPUT HEAT PIPE
William B. Hall, Landisville, and Fred G. Block, Lancaster, both of Pa., assignors to RCA Corporation
Filed Dec. 7, 1964, Ser. No. 418,946
Int. Cl. F28d 15/00
U.S. Cl. 165—32 5 Claims



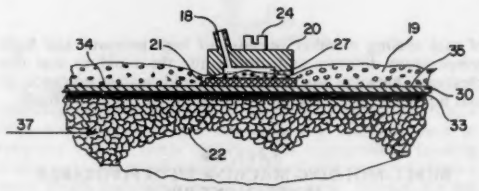
A heat pipe is provided with a noncondensible gas reservoir at the condenser end. The pressure of the gas and the size of the reservoir are selected to prevent a large change in the operating pressure, and thus the operating temperature, if the heat input to the heat pipe decreases.

3,613,774
UNILATERAL HEAT TRANSFER APPARATUS
Frank E. Bliss, Jr., Reeds Ferry, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.
Filed Oct. 8, 1969, Ser. No. 864,777
Int. Cl. F28d 15/00
U.S. Cl. 165—32 6 Claims



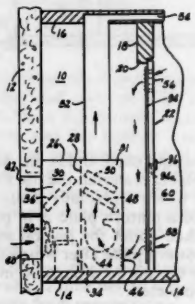
Unilateral heat transfer apparatus comprises an evacuated heat transfer chamber wherein the evaporator surface is covered with a suitable capillary structure. Heat added to the evaporator vaporizes a working fluid and the vapors move to a condenser where they give up their heat of vaporization and condense. The condensate is returned by gravity to the capillary structure. The device conducts heat readily in one direction but has a high resistance to heat flow in the opposite direction.

3,613,775
SELF-REGULATING COOLING SYSTEM
Daniel L. Curtis, Manhattan Beach, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.
Filed May 19, 1969, Ser. No. 825,812
Int. Cl. F28f 7/00
U.S. Cl. 165—46 4 Claims



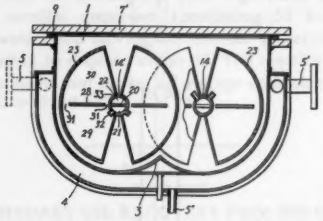
A self-regulating cooling system to remove metabolic heat from the coolant loop in a life support system used in space activity. Coolant passes through a sublimator as part of the coolant loop which also includes a pulse pump and a coolant garment. A separate water storage container provides feedwater to the sublimator where it is sublimated along a surface thermally connected to a heat exchange element through which the coolant flows.

3,613,776
CLOSET DOOR HAVING HIGH-LOW RETURN AIR SUPPLY FOR AIR CONDITIONER
Joseph D. Loveley, Grosse Pointe Woods, Mich., assignor to American Standard Inc., New York, N.Y.
Filed Apr. 30, 1970, Ser. No. 33,218
Int. Cl. F25b 29/00
U.S. Cl. 165—48 4 Claims



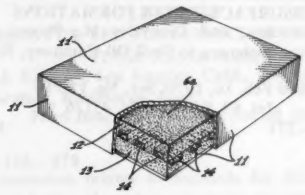
An air conditioner housed within the closet of a living space, particularly an apartment, said closet having a special door construction equipped with dampered openings adjacent its top and bottom edges. During the cooling season the air conditioner draws its supply air from the upper door openings and during the heating season the air conditioner draws its supply air through the lower door openings. The invention improves the air conditioner efficiency and minimizes stratification and temperature differentials between the floor and ceiling.

3,613,777
HEAT EXCHANGE APPARATUS FOR POWDERED MATERIALS
Jiyuichi Nara, 7-8, Higashi-ooi 2-chome, Shinagawa-ku, Tokyo, Japan
Filed Oct. 13, 1969, Ser. No. 865,632
Claims priority, application Japan, Feb. 18, 1969, 44/12064
Int. Cl. F28d 11/02
U.S. Cl. 165—86 4 Claims



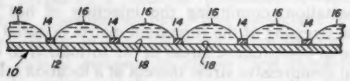
A heat exchange apparatus for powdered materials characterized by a plurality of wedge-shaped hollow revolving bodies mounted in a rotating shaft circumferentially of the shaft, a heat exchange medium being passed from said shaft into said hollow revolving bodies, powdered materials being moved in an axial direction, said powdered materials being heated or cooled by said revolving bodies.

3,613,778
FLAT PLATE HEAT PIPE WITH STRUCTURAL WICKS
Karl T. Feldman, Jr., Albuquerque, N. Mex., assignor to Northrop Corporation, Beverly Hills, Calif.
Filed Mar. 3, 1969, Ser. No. 803,582
Int. Cl. F28d 15/00
U.S. Cl. 165—105 1 Claim



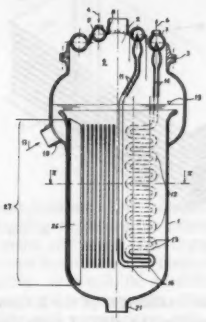
A heat pipe having a flat plate construction. One wick of screen wire honeycomb is disclosed, and another wick of porous metal layers having grooves therein for vapor flow, these wicks providing a strengthening function.

3,613,779
APPARATUS FOR OBTAINING HIGH TRANSFER RATES IN FALLING WATER FILM EVAPORATORS AND CONDENSERS
Clinton E. Brown, Silver Spring, Md.
Filed Oct. 6, 1969, Ser. No. 864,092
Int. Cl. F28f 13/18
U.S. Cl. 165—133 13 Claims



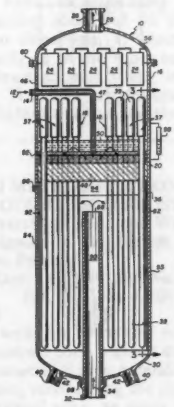
Narrow strips of very thin hydrophobic material are arranged in parallel rows on a hydrophilic heat exchange substrate for use in fluid evaporation or condensation. Fluid rivulets of arcuate cross section form on the hydrophilic substrate between the hydrophobic strips, resulting in an improved heat transfer coefficient relative to systems employing a uniform fluid thickness. Increased fluid surface area and vertical motion of the rivulets account in part for the improved coefficient.

3,613,780
LIQUID METAL HEAT EXCHANGERS WITH PRESSURE ABSORBING MEANS
Sergio Bruschetti, Via T. Tasso 9/8, Savona, and Ennio Zummo, Via Dagnino 3B/3, Genoa-Pegli, both of Italy
Filed Aug. 28, 1969, Ser. No. 853,734
Claims priority, application Italy, Sept. 25, 1968, 7355A/68
Int. Cl. F28f 19/00
U.S. Cl. 165—134 12 Claims



Heat exchangers of the type using liquid sodium as a heat exchange fluid contain chambers inside their casings which are susceptible of collapse and/or breakage for the purpose of limiting the consequences of a reaction of sodium with water and steam in case of damage or failure to the means separating the two fluids.

3,613,781
BAYONET TUBE BANK VAPOR GENERATOR
Robert O. Barratt, Parsippany, N.J., assignor to Foster Wheeler Corporation, Livingston, N.J.
Filed July 22, 1969, Ser. No. 843,527
Int. Cl. F28f 9/22
U.S. Cl. 165—145 10 Claims



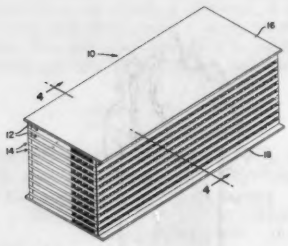
This invention relates to a sodium heated vapor generator utilizing a parallel, multiple bayonet tube configuration, with

each tube configuration having an annular helical swirl chamber retained within an outer pressure baffle tube and encircling an inner water inlet tube. A fluid is circulated through the inlet tubes which in turn extend into the pressure tubes which are immersed in a body of hot sodium liquid.

3,613,782
COUNTERFLOW HEAT EXCHANGER

John L. Mason, Palos Verdes Estates, and Robert W. Greenwood, Redondo Beach, both of Calif., assignors to The Garrett Corporation, Los Angeles, Calif.

Filed Aug. 27, 1969, Ser. No. 853,248
Int. Cl. F28f *3/00*
U.S. Cl. 165—166 **16 Claims**

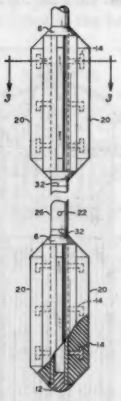


A counterflow heat exchanger of the Z-flow or U-flow type in which the flow passage heights of each fluid are varied so as to minimize pressure drop.

3,613,783
APPARATUS FOR INSTALLING UNDERWATER WELL EQUIPMENT

Ed O. Seabourn, Stavanger, Norway, assignor to Phillips Petroleum Company

Filed Oct. 29, 1969, Ser. No. 872,327
Int. Cl. E21b *33/035, 17/10*
U.S. Cl. 166—.5 **4 Claims**

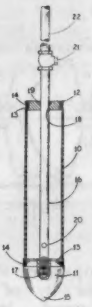


An apparatus having a nozzle for propulsion and rubber centralizing and guiding ribs for installing equipment on an underwater conduit.

3,613,784
SEISMIC BOREHOLE PLUG

Peppino Bassani, 127 Laurier Drive, Edmonton, Alberta, Canada

Filed Jan. 26, 1970, Ser. No. 5,836
Int. Cl. E12b *33/127*
U.S. Cl. 166—187 **8 Claims**

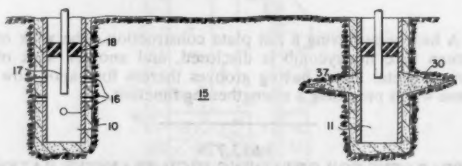


A tubular inflatable bag has its lower end secured to a bottom closure cap at the lower end of an air pipe which has a lateral passage for admitting air under pressure into the bag. The upper end of the bag is secured to a top closure cap which is slidable along the pipe as the bag expands during inflation. Upward sliding of the top cap is limited by an abutment provided on the pipe above the bag, the abutment consisting of a housing which contains a valve for controlling airflow through the pipe.

3,613,785
PROCESS FOR HORIZONTALLY FRACTURING SUBSURFACE EARTH FORMATIONS

Philip J. Closmann, and Dionysios M. Phocas, both of Houston, Tex., assignors to Shell Oil Company, New York, N.Y.

Filed Feb. 16, 1970, Ser. No. 11,710
Int. Cl. E21b *43/24, 43/26*
U.S. Cl. 166—271 **10 Claims**



Horizontal fractures are formed in a subsurface earth formation which tends to fracture vertically at the naturally occurring formation temperature by a process which includes the steps of extending at least one well borehole into the formation, generating a vertical fracture by pressurizing said borehole, injecting hot fluid into at least one borehole to heat the formation, continuing the injection of hot fluid until thermal stressing of the formation matrix material causes the horizontal compressive stress in the formation to exceed the vertical compressive stress therein at a location selected for a second well, extending the borehole of the second well into the formation, and hydraulically fracturing the formation through this second well borehole to form a horizontal fracture extending therefrom into the formation.

3,613,786

OIL RECOVERY METHOD USING HIGH WATER CONTENT OIL-EXTERNAL MICELLAR DISPERSIONS

Stanley C. Jones, Littleton; Wayne O. Roszelle, Littleton, and Marvin A. Svaldi, Morrison, all of Colo., assignors to Marathon Oil Company, Findlay, Ohio

Filed Mar. 23, 1970, Ser. No. 22,087
Int. Cl. E21b *43/22*
U.S. Cl. 166—273 22 Claims

Crude oil within a subterranean formation is recovered by injecting into the formation a novel high water content oil-external micellar dispersion (containing 55 to about 90 percent water) and moving the micellar dispersion through the formation to displace crude oil. The micellar dispersion contains a surfactant having an average equivalent weight of about 350 to about 525.

3,613,787

SECONDARY OIL RECOVERY PROCESS USING MICELLAR DISPERSIONS

William C. Tosch, Parker, and Charles B. Wenger, Denver, both of Colo., assignors to Marathon Oil Company, Findlay, Ohio

Filed Aug. 28, 1969, Ser. No. 853,919
Int. Cl. E21b *43/22*
U.S. Cl. 166—273 17 Claims

Oil is recovered from a subterranean oil-bearing reservoir by injecting a micellar dispersion into the reservoir and displacing it toward a production means in fluid communication with the reservoir; the dispersion is comprised of hydrocarbon, aqueous media, surfactant, carbohydrate and optionally cosurfactant and/or electrolyte. Examples of useful carbohydrates include glucose and sucrose.

3,613,788

METHODS FOR THE TREATMENT OF TERRESTRIAL FLUID RESERVOIRS

George J. Kautsky, Los Angeles, Calif., assignor to Textilana Corporation, Hawthorne, Calif.

Filed June 22, 1970, Ser. No. 48,387
Int. Cl. E21b
U.S. Cl. 166—279 20 Claims

This invention relates to methods for the treatment of aquifers and oil and gas formations by injection thereinto of polyalkylene polyamino polykis methylene phosphonic acids and their salts to prevent scale and inhibit corrosion.

3,613,789

METHOD USING MICELLAR DISPERSIONS IN MULTIPLE FRACTURING OF SUBTERRANEAN FORMATIONS

Marion O. Son, Jr., Littleton, Colo., assignor to Marathon Oil Company, Findlay, Ohio

Filed Mar. 16, 1970, Ser. No. 20,102
Int. Cl. E21b *33/13, 43/26*
U.S. Cl. 166—281 26 Claims

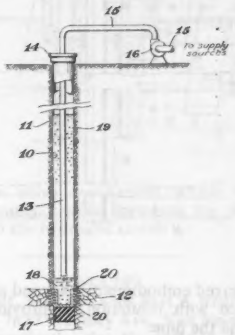
A subterranean formation is fractured by injecting under fracturing pressures a micellar dispersion comprised of hydrocarbon, aqueous medium, and surfactant. Propping agents are useful in the dispersion. The viscosity of the dispersion can be designed to obtain "low bleedoff rates" and retard settling of the propping agents. Additional, distinct fractures are obtained by sealing off previously formed fracture(s) with a diverting agent and then injecting again at fracturing pressures the micellar dispersion.

3,613,790

METHOD OF PLUGGING A FORMATION

Caleb M. Stout, Tulsa; Charles F. Smith, Tulsa, and Thomas J. Nolan, III, Langston, all of Okla., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sept. 24, 1969, Ser. No. 860,730
Int. Cl. E21b *33/138*
U.S. Cl. 166—294 11 Claims



A novel composition and method is provided for temporarily plugging wellbores for extended periods of time, e.g., up to 10 years and more. The composition comprises a thickened aqueous based mixture containing water-swellable clay and inorganic, acid soluble particles, such as minerals, e.g., $CaCO_3$, as solid constituents. The method comprises introducing said novel composition into a well to be plugged followed by a sufficient amount of an aqueous medium to provide a hydrostatic head over and in contact with said composition which exerts a pressure on said mixture which is greater than the formation pressure at the point of application. The plugging composition can be removed from the well when desired by contacting it with acidic solutions.

3,613,791

PROCESS FOR STIMULATION OF GAS-PRODUCING WELLS

Walter B. Kirk, Robinson, Ill., assignor to Marathon Oil Company, Findlay, Ohio

Filed Mar. 19, 1970, Ser. No. 21,201
Int. Cl. E21b *43/25*
U.S. Cl. 166—305 R 11 Claims

Stimulation of gas-producing wells is effected by 1) injecting about 1–500 gallons of micellar dispersion per vertical foot of hydrocarbon-bearing formation into the formation, 2) injecting about 0.1–10 volumes of water per volume of micellar dispersion, 3) injecting sufficient gas to displace substantially all of the water out into the formation to a radius of at least about 7.5 feet, and 4) permitting the well to produce. The micellar dispersion is comprised of hydrocarbon, surfactant and aqueous medium.

3,613,792

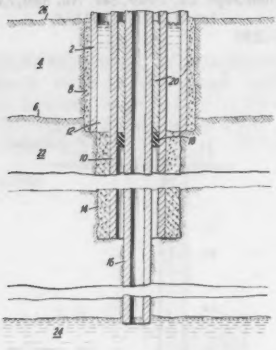
OIL WELL AND METHOD FOR PRODUCTION OF OIL THROUGH PERMAFROST ZONE

John W. Hyde, Riverside, Conn., and William J. George, New York, N.Y., assignors to The British Petroleum Company Limited, London, England

Filed Dec. 11, 1969, Ser. No. 884,282
Int. Cl. E21b *43/00*
U.S. Cl. 166—315 24 Claims

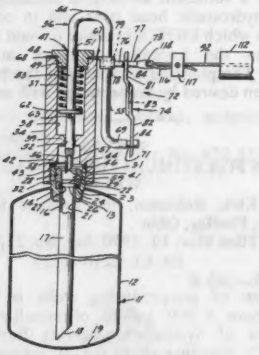
Production oil wells for extracting warm oil from ground containing a permafrost zone without causing the oil to melt the permafrost comprise a pipe extending down into the oil pool, an inner casing surrounding the pipe and running down through the permafrost zone, an outer casing running down through the permafrost zone, surrounding the inner casing and spaced to define an airgap or annulus with the inner casing and means, such as a liquid heat exchange fluid or a

refrigerating boiling liquid, in the annulus to inhibit heat transfer from the pipe to the ground surrounding the outer



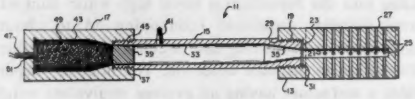
casing. In preferred embodiments a second annulus or airgap, optionally filled with insulation, is provided between the inner casing and the pipe.

3,613,793
FIRE EXTINGUISHER SYSTEM
Charles K. Huthsing, Jr., Old School Road, Libertyville, Ill.
Filed Oct. 6, 1969, Ser. No. 863,992
Int. Cl. A62c *35/36*
U.S. Cl. 169—26 **11 Claims**



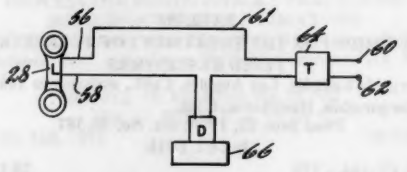
A fire extinguisher being automatically actuated upon sensing an elevated temperature or manually actuated either at the extinguisher location or from a remote location. The fire extinguisher generally includes a cylinder containing fire extinguishing material and having an outlet passageway sealed by a rupturable membrane, a puncturing means biased in a direction to puncture the membrane and normally retained against the bias in a cocked position such that triggering of the puncturing means will puncture the membrane and permit egress of the fire extinguishing material from the cylinder in a predetermined, controlled direction, and means actuating or triggering the puncturing means. The actuating means includes a fusible link retaining the puncturing means against the bias in a cocked position so that melting of the link will cause the membrane to be punctured and the fire-extinguishing material dispersed. Also, the actuating means includes a manually operated triggering device releasable at the extinguisher location or remotely and normally retaining the puncturing means in a cocked position so that release of the manually operated device will cause the fire-extinguishing material to be dispersed.

3,613,794
LIQUID AEROSOL DISPENSER
Robert J. Naumann, Huntsville, and David W. Jex, Guntersville, both of Ala.
Filed Aug. 7, 1970, Ser. No. 61,894
Int. Cl. A62c *35/08*
U.S. Cl. 169—28 **4 Claims**



A liquid aerosol dispenser is disclosed having an explosively driven piston that compresses a light gas to an extremely high pressure so as to rupture a first sealer on a container holding the liquid to allow admixing of the gas and the liquid. The container has a plurality of discharge nozzles covered with a rupturable sealer and upon rupture of the first sealer and admixing of the light gas and liquid, the sealer covering the nozzles is ruptured so as to allow the liquid to be expelled through the nozzles at a very high velocity in extremely fine droplet form.

3,613,795
ELECTRICALLY AND/OR THERMALLY ACTUATED RELEASE LINK
Raymond George Amicone, Springfield; Charles T. Davey, Dresher, and Warren J. Dunning, Philadelphia, all of Pa., assignors to Air Balance, Inc., Chicago, Ill.
Filed Aug. 13, 1969, Ser. No. 849,811
Int. Cl. A62c *37/30*
U.S. Cl. 169—42 **18 Claims**

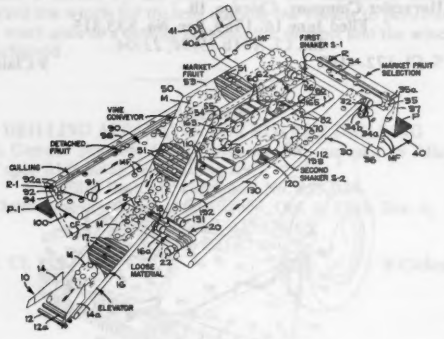


An electrothermal release detent that is equally responsive to either electrical or thermal stimuli which serves to release fire control apparatus such as a fire and/or smoke damper positioned within air-handling ducts or in other portions of building construction to thereby prevent the rapid spread of fire and smoke through the protected area.

3,613,796
SELECTIVE SORT VINE CROP HARVESTER
David W. Cayton, Cupertino, and William G. Malley, San Jose, both of Calif., assignors to FMC Corporation, San Jose, Calif.
Filed June 24, 1970, Ser. No. 49,415
Int. Cl. A01d *17/08*
U.S. Cl. 171—27 **26 Claims**

A mobile field tomato harvester picks up a mass of vines and some dirt with a double pair of weeder bars and conveys the mass to an initial shaker which detaches fruit and delivers it to a side sort culling station embodying a sorting reel. Before reaching the initial shaker, the mass passes over a gap where loose fruits and clods fall onto a loose-material-screening conveyor and are conveyed to a rear market fruit selection station which includes another sorting reel. At this reel, the market fruit is passed on to a market fruit conveyor and culls are automatically rejected. Resuming description of the vine flow, after leaving the initial shaker, the vines are

turned over and reshaken on a second shaker. The fruit detached by the second shaker is delivered to the same



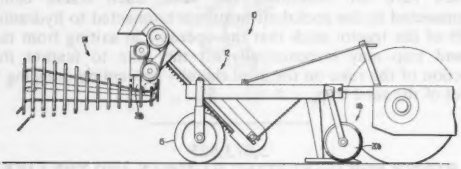
screening conveyor that receives the loose material initially falling from the mass before the mass reaches the first shaker, as described above.

3,613,797

PEANUT DIGGER, SHAKER AND INVERTER

Carroll J. Whitfield, and Jack C. Whitesides, both of Columbus, Ga., assignors to Kelley Manufacturing Company, Columbus, Ga.

Filed Apr. 16, 1970, Ser. No. 29,137
Int. Cl. A01d *29/00*
U.S. Cl. 171—61 **12 Claims**



A peanut digger-shaker-inverter apparatus for use in harvesting peanuts wherein two crop rows of peanut-laden plants are simultaneously removed from the ground, elevated above the ground as the apparatus proceeds down the crop rows, shaken to remove the dirt from the plants, and deposited back on the ground in a single row with foliage adjacent the ground and the roots and peanuts above the ground so as to be exposed to sun and air for drying. The inverter receives the plants generally in an upright attitude and in spaced-apart paths from the shaker and continues the movement of the plants in the spaced-apart paths away from the shaker and rolls or twists the plants along their direction of movement so as to move the foliage of the plants down between the paths so that the plants are deposited upon the ground in inverted positions.

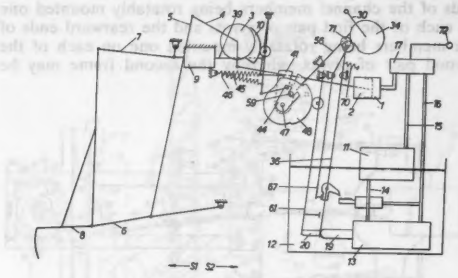
3,613,798

HYDRAULIC CONTROL SYSTEM FOR AGRICULTURAL IMPLEMENTS

Chandra Mohan; Gursharan Singh Rihal, and Balbir Singh Devgun, all of Durgapur, India, assignors to Council of Scientific and Industrial Research, New Delhi, India

Filed May 6, 1969, Ser. No. 822,252
Claims priority, application Great Britain, July 29, 1968, 36,051/68
Int. Cl. A01b *63/112*; G05d *11/00*
U.S. Cl. 172—9 **26 Claims**

A control mechanism for agricultural implements mounted on three-point linkages in tractors includes a valve mechanism which controls the hydraulic circuit. A single selection and operational control device operates the implements and draft- and position-sensing means act through a cam and lever arrangement for controlling the



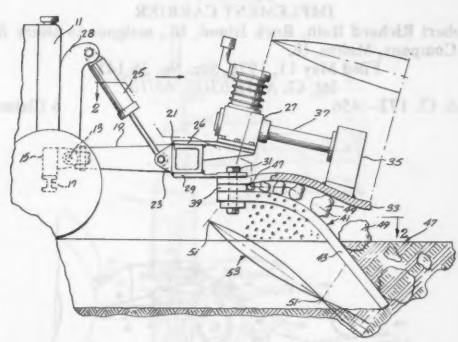
operation of the valve mechanism which includes two concentrically arranged valve members for regulating the flow of the fluid in the hydraulic circuit.

3,613,799

SONIC SOIL TILLER AND ROCK REDUCER

Albert G. Bodine, 7877 Woodley Ave., Van Nuys, Calif.

Continuation of application Ser. No. 460,628, June 2, 1965, now Patent No. 3,410,351, which is a continuation-in-part of application Ser. No. 326,419, Nov. 27, 1963, now Patent No. 3,269,039, which is a continuation-in-part of application Ser. No. 163,802, Jan. 2, 1962, now abandoned , which is a division of application Ser. No. 839,196, Sept. 10, 1959, now Patent No. 3,030,715. This application July 5, 1968, Ser. No. 742,933
Int. Cl. A01b *35/00*; E21c *37/20*
U.S. Cl. 172—40 **5 Claims**



A device for cultivating earth and breaking up rocks or field stones for attachment to a tractor and the like comprising a first wide metal plate having an orbiting mass oscillator fixed thereto and a second plate divergent from the first plate having a plurality of metal tines for engagement with the ground. The two plates are coupled together at their base where they converge. A tuning fork effect is achieved through the vibration of the two plates by the oscillator crushing rocks and soil picked up by the tines.

3,613,800

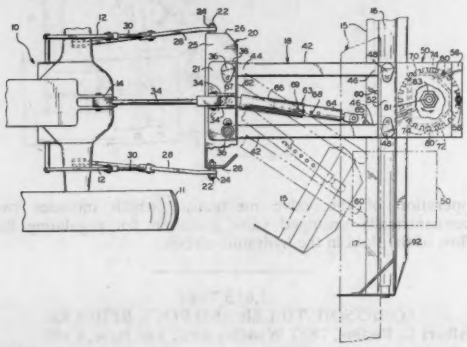
MOUNTING FOR TERRACING BLADE

Calvin F. Martin, Rte. 1, Box 136, Nyssa, Oreg.

Filed Apr. 9, 1971, Ser. No. 814,741
Int. Cl. A01b *59/06, 63/00, 65/02*
U.S. Cl. 172—447 **1 Claim**

A mounting for a terracing or like earth-moving blade having a first frame adapted to be attached to the rear of a tractor, a pair of transversely spaced substantially vertical pivots mounted in the first frame, a second frame disposed

rearwardly of the first frame, a second pair of transversely spaced substantially vertical pivots mounted in the second frame, and a pair of parallel longitudinally extending members joining the first and second frames, the forward ends of the channel members being rotatably mounted one on each of the first pair of pivots and the rearward ends of the members being rotatably mounted one on each of the second pair of pivots, whereby the second frame may be

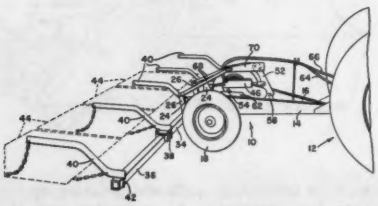


moved transversely but maintained parallel with respect to the first frame. A substantially vertical member depends from and is rotatably attached to the second frame, and an earth-moving blade is mounted on the vertical member for rotation therewith relative to the second frame. Means are also provided to permit the earth-moving blade to rotate about a horizontal axis through the vertical member.

3,613,801
IMPLEMENT CARRIER

Robert Richard Roth, Rock Island, Ill., assignor to Deere & Company, Moline, Ill.

Filed May 11, 1970, Ser. No. 36,141
Int. Cl. A01b *63/32, 63/10*
U.S. Cl. 172—456 **6 Claims**

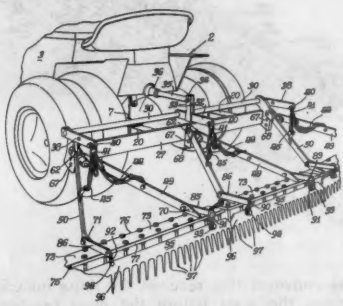


An agricultural implement having a tool-supporting drawbar pivotally carried on a draft frame for movement about a transverse axis between a lowered groundworking position and raised field and road transport positions. An extensible and retractable hydraulic cylinder is connected to a drawbar through a lever arm and pivoted links to move the drawbar about the transverse axis to the field transport position upon full extension of the hydraulic cylinder. A releasable locking means is provided to fixedly secure one of the links to the lever arm to form an extension of the lever arm so that upon full extension of the hydraulic cylinder the drawbar is moved about the transverse axis to the road transport position.

3,613,802
SAND TRAP RAKE FOR GOLF COURSES

V. Robert Carlson, Aurora; Joseph Dinelli, Glenview, Ill., and Joel F. Jones, Claremore, Okla., assignors to International Harvester Company, Chicago, Ill.

Filed June 16, 1969, Ser. No. 833,515
Int. Cl. A01b *19/04, 23/04*
U.S. Cl. 172—197 **9 Claims**

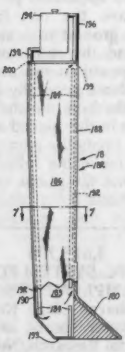


A sand trap rake mounted on the tractor comprising a transverse mounting member, a plurality of hitch elements spaced transversely of the mounting member and secured thereto and a V-shaped draft frame member connected to each hitch element, a rake connected to each frame member for floating movement therewith, each frame member having its apex adjacent to the respective hitch element and a universal connection fastening each draft member at its apex to the related hitch element and a toothed comb hung behind each rake for smoothing the sand, each frame being connected to the rockshaft in turn is connected to hydraulic lift of the tractor such that the operator in exiting from the sand trap may incrementally lift the rake to feather the action of the rake on the sand thereby preventing dragging it out of the sand trap.

3,613,803
RIPPER FOR DISRUPTING HARDPAN AND THE LIKE

Jackie O. Payne, 5155 N. Fresno Apt. 197, Fresno, Calif.

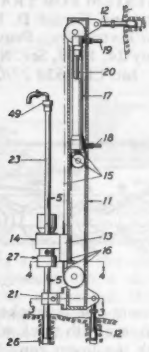
Filed Sept. 17, 1969, Ser. No. 858,831
Int. Cl. A01b *13/08, 3/68*
U.S. Cl. 172—699 **2 Claims**



A ripper for disrupting hardpan, plowpan, compacted soil and the like, characterized by the utilization of a plurality of fluid-cooled, hardpan ripper chisels, mounted on a horizontally displaceable support, a prime mover, including a power plant mounted on a transport vehicle, and tackle interconnecting the prime mover with the support; a feature

of the invention being the employment of a power driven winch operatively coupled, through an assemblage of cables and sheaves with the support in a manner such that, as the winch is driven by the power plant, the support is drawn toward the winch for thereby causing the chisels to penetrate the work area as a closing between the support and the winch is achieved.

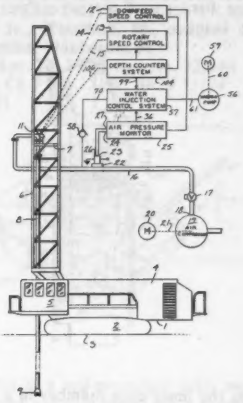
3,613,804
DRILLING APPARATUS FOR ROTARY DRILLING
Nils Gunnar Jonsson, Jakobsberg, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden
Filed Sept. 18, 1969, Ser. No. 859,024
Claims priority, application Sweden, Oct. 4, 1968, Dec. 4, 1968, 13476/68;13476/68
Int. Cl. E21c *1/10*
U.S. Cl. 173—149 **8 Claims**



A rock drilling apparatus for rotary drilling has a chuck which is axially movable by means of a double-acting, pressure fluid actuated feed motor. It has also a stationary chuck. The movable chuck grips a drill string when supplied with pressure fluid; the stationary chuck grips the drill string when relieved of pressure fluid. During inserting or withdrawing of the drill string, the supply conduits of the chucks are connected to either of the supply conduits of the feed motor so that, automatically, the chucks operates concordantly with the feed motor.

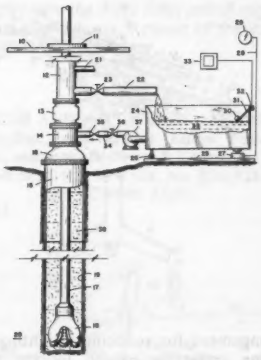
3,613,805
AUTOMATIC CONTROL FOR ROTARY DRILL
Jon R. Lindstad, South Milwaukee, and Thomas A. Stoner, Brookfield, both of Wis., assignors to Bucyrus-Erie Company, South Milwaukee, Wis.
Filed Sept. 3, 1969, Ser. No. 854,963
Int. Cl. E21b *3/02;* **E21c** *1/10*
U.S. Cl. 175—27 **7 Claims**

An automatic blasthole drill, in addition to rotary and downfeed speed controls, has an automatic depth control to effect collaring and automatic hoist when desired depth is reached, an automatic water injection system responsive to the depth control and air pressure devices to control the amount and turnoff of water injection, and air-pressure-responsive protective devices to vary water injection and to trigger automatic shut down. The circuits and devices for effecting the mentioned controls are disclosed in detail. A copending application incorporated by reference discloses a



downfeed speed and force control responsive to rotary torque.

3,613,806
DRILLING MUD SYSTEM
Raymond A. Malott, Fullerton, Calif., assignor to Shell Oil Company, New York, N.Y.
Filed Mar. 27, 1970, Ser. No. 23,125
Int. Cl. E21b *35/00, 41/00*
U.S. Cl. 175—48 **6 Claims**

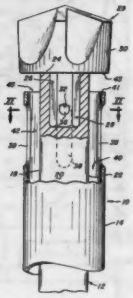


Apparatus for monitoring and maintaining the hydrostatic head of a column of drilling mud in a well bore substantially constant as pipe is pulled from or run into the hole in well-drilling operations. A mud tank is provided with weighing means to measure the weight of fluid in the tank and connected by suitable conduits to the well bore so that all fluid flowing into or out of the well bore passes through the tank.

3,613,807
DRILL ROD WITH DUST-COLLECTING MEANS
Alex J. Galis, Heatherbrae Square, Apt. 101, Indiana, Pa.
Filed Aug. 14, 1969, Ser. No. 850,080
Int. Cl. E21b *21/00;* **E21c** *7/00*
U.S. Cl. 175—209 **6 Claims**

A drill rod for use in rotary percussion drilling includes an elongated inner solid core member and an outer tubular member positioned coaxially around the inner core member.

The outer tubular member is spaced from the core member to provide a passageway therebetween for the flow of dust and drill cuttings therethrough. The outer tubular member has a plurality of longitudinal ports adjacent the bit through which the dust and cuttings enter the passageway. The bit is



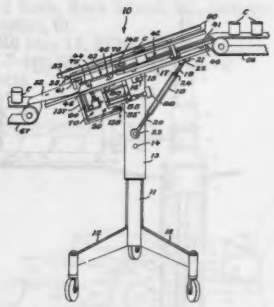
supported by the inner core member in a recessed axial bit-shank-receiving portion and the percussive and torsional forces are transmitted to the drill bit through the inner core member.

3,613,808

ARTICLE-SORTING APPARATUS WITH TRANSFER-ERROR-REDUCING ARRANGEMENT

Philip R. Bunnelle, Santa Clara, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed Dec. 18, 1968, Ser. No. 784,774
Int. Cl. G01g *13/00*
U.S. Cl. 177—53 **3 Claims**



An arrangement for reducing weighting inaccuracies in article-sorting apparatus caused by the advancement of continuously moving articles to be weighed onto the weighing platform of a check weighing apparatus. The arrangement employs suitable lockup means, such as a fluid-activated device, that holds or locks the weighing platform in the raised position until the error-producing activity of the continuously moving article advancing onto the weighing platform has subsided. The lockup means releases the weighing platform during the weighing operation so that the platform is freely deflectable during the weighing operation.

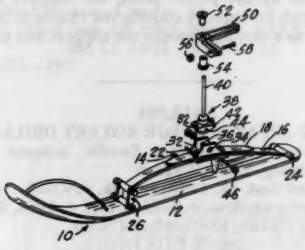
3,613,809

SKI LEG FOR A SNOWMOBILE-TYPE VEHICLE

Guy-Noel Chaumont, 138 rue Gaulin, Princeville, Quebec, Canada

Filed June 17, 1969, Ser. No. 834,103
Int. Cl. B62d
U.S. Cl. 180—5 R **3 Claims**

The present invention relates to the construction of the ski leg used on a snowmobile type vehicle for supporting the ski structure which is used to steer the vehicle. The improvement consists in providing to the ordinary ski leg a



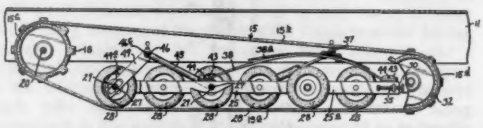
member which limits the longitudinal swing of the ski structure when the vehicle, travelling at relatively high speed, is jolted into a free-in-air position.

3,613,810

SUSPENSION SYSTEM FOR TRACKED VEHICLES

Donnelly L. Hetteen, and Gerald D. Reese, both of Roseau, Minn., assignors to Textron Inc., Providence, R.I.

Filed July 24, 1969, Ser. No. 844,316
Int. Cl. B62d *27/02*
U.S. Cl. 180—5 R **6 Claims**



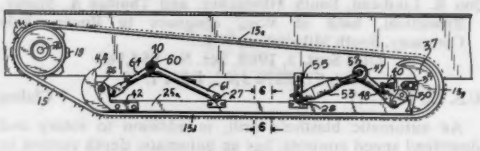
A suspension system for a tracked vehicle including a unitary suspension frame with track wheels mounted thereon for engagement with the lower run of the drive track. Idler means mounted on the rear end of the suspension frame support the rear end of the drive track. Spring means are provided to support the vehicle body on the suspension frame. The spring means are connected such that a predetermined amount of longitudinal relative movement is permitted between the suspension frame and the body. A rearwardly and downwardly sloping control arm is pivotally connected between the body and the front end of the suspension frame so that the forwardly located track wheels are forced downwardly by the control arm when the suspension frame moves forwardly with respect to the body.

3,613,811

TRACKED VEHICLE SUSPENSION SYSTEM

Ronald I. Brandli; Lawrence E. Klema, and Gerald D. Reese, all of Roseau, Minn., assignors to Textron Inc., Providence, R.I.

Filed July 30, 1969, Ser. No. 846,153
Int. Cl. B62m *27/02*
U.S. Cl. 180—5 **8 Claims**



A suspension system for a tracked vehicle is shown, having a unitary suspension frame including a pair of relatively flexible slide rails for engagement with the lower run of the drive track. Idler means mounted on the rear end of the frame support the rear end of the track. Front and rear pairs

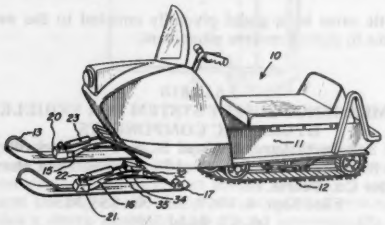
of sloping support arms are pivotally connected to the body at their upper ends and are connected to the frame at their lower ends by pivotable link members that accommodate limited relative longitudinal movements between the frame and the body. Front and rear suspension spring means are mounted between the body and the frame. Rearwardly and downwardly sloping control arm means are pivotally connected between the body and the front end portion of the frame so that the pivotal movements thereof force the frame away from the body when the frame moves forwardly with respect to the body, thereby forcing the drive track into tighter engagement with the ground. The front pair of support arms limits the pivotal movements of the control arm means.

3,613,812

SHOCK MOUNTED SKIS FOR SNOWMOBILE

Edgar E. Hetteen, Thief River Falls, Minn., assignor to Arctic Enterprises, Inc., Thief River Falls, Minn.

Filed Dec. 22, 1969, Ser. No. 887,138
Int. Cl. B62b *13/12*; B62m *27/02*
U.S. Cl. 180—5 R **4 Claims**



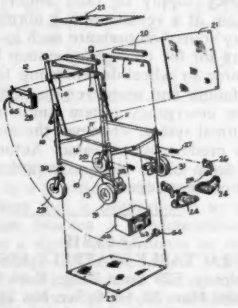
Each spindle forming a part of the steering mechanism of the snowmobile is connected to a ski through its spring mechanism and is also connected through a lever arm extending along the longitudinal axis of the ski by a shock absorber. The shock absorber is pivotally connected to the lever arm which is secured to the spindle at one end, and to the ski at the other end. The shock absorber resists any changes in substantially vertical and rotational motions of the ski with respect to the spindle. The ski is stabilized against sudden impulses by the dampening action of the shock absorber.

3,613,813

WHEELCHAIRS

Raymond G. Biddle, 29 Hillcrest Road, Romsley, Halesowen, in the county of Worcester, England

Filed May 16, 1969, Ser. No. 825,276
Claims priority, application Great Britain, May 16, 1968, 23,277/68
Int. Cl. B62d *11/04*; B60k *7/00*
U.S. Cl. 180—6.5 **3 Claims**



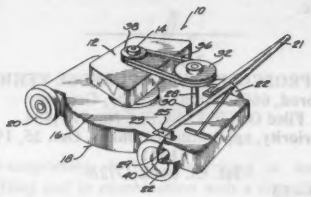
A motorized wheelchair which has a pair of driving wheels, an electric motor for driving each of the wheels, the wheels being mounted on and supported by output shafts extending from the housings of the associated motors.

3,613,814

VARIABLE SPEED DRIVE FOR LAWN MOWER

Walter F. Prien, Jr., Woodhull, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Apr. 28, 1970, Ser. No. 32,644
Int. Cl. F16h *15/08*; B62d *51/04*
U.S. Cl. 180—19 H **8 Claims**



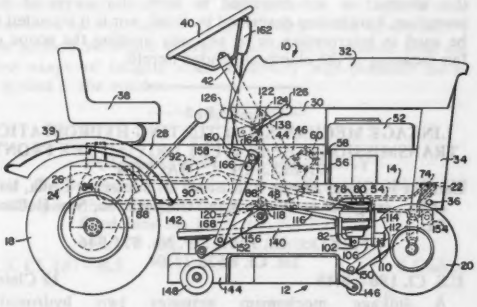
Disclosed herein is a self-propelled lawn mower with a combined clutch and variable speed drive controlled by the mower handle. The drive includes a vertical or intermediate shaft driven by the engine output shaft and a horizontal cross-shaft which is drivingly connected to the mower wheels. The vertical shaft is provided with a friction drive wheel and the horizontal shaft is provided with a friction disc. Power is transferred from the vertical shaft to the horizontal shaft by an idler wheel which is supported on the horizontal shaft for movement in a radial direction with respect to the axis of the horizontal shaft and the friction disc. The position of the idler wheel is controlled by the mower handle through a link or rod. Forward movement of the mower handle causes the idler to float axially of the horizontal shaft into engagement with the friction disc and friction roller. Further forward movement of the mower handle causes radial movement of the idler toward the center of the friction disc to vary the drive ratio and change the rate of rotation of the mower wheels. Release of the mower handle causes disengagement of the drive.

3,613,815

TRACTOR AND IMPLEMENT ASSEMBLY

John Gary Meylink, and Robert James Bishop, both of Horicon, Wis., assignors to Deere & Company, Moline, Ill.

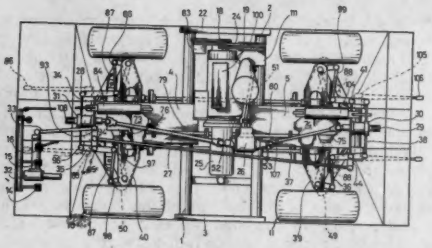
Filed Sept. 9, 1969, Ser. No. 856,926
Int. Cl. B60k *25/02*
U.S. Cl. 180—53 **7 Claims**



A tractor and driven implement assembly in which the tractor has a vertical crankshaft engine carried by an engine support frame. The support frame is carried on the tractor main frame by resilient mounts which isolate engine vibrations from the main frame. The engine crankshaft extends below the support frame and carries a pair of sheaves which are operatively connected to the tractor transmission and driven implement by endless flexible belts. The upper

sheave is fixed to the crankshaft for rotation therewith, and the lower sheave is rotatably mounted on the crankshaft and is axially shiftable into selective engagement with the upper sheave for selective rotation therewith. An actuating lever is connected to a horizontal pivot carried by a bracket depending from the engine support frame and is operatively connected to the lower sheave to vertically shift the same into selective engagement with the upper sheave. A stationary brake member for the lower sheave also depends from the engine support frame and engages the lower sheave when the lower sheave is lowered from engagement with the upper sheave.

3,613,816
SELF-PROPELLED MULTIPURPOSE VEHICLE
Walter Gutbrod, 6601 Bubingen, Saar, Germany
Filed Oct. 7, 1968, Ser. No. 765,454
Claims priority, application Germany, Oct. 25, 1967, G 51431
Int. Cl. B60k *17/28*
U.S. Cl. 180—53 **11 Claims**

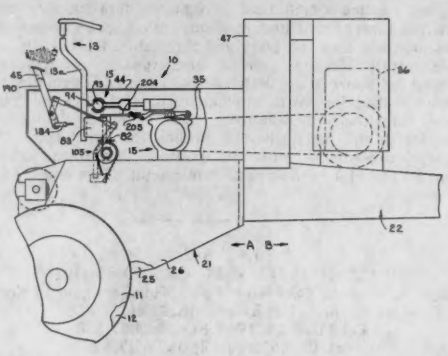


This invention relates to multipurpose, self-propelled utility vehicles of the two axle type comprising a chassis, a driving mechanism unit disposed transversely to the vehicle's longitudinal axis and mounted on said chassis intermediate the two wheel axles, wherein said mechanism comprises a fuel-burning engine and a gear shift drive or transmission disposed within a troughlike cruciform frame, and power takeoff and hoist means projecting from substantially the center of said chassis along the longitudinal axis of said vehicle, and selectively operable by V-belt pulley members.

The purpose of the above abstract is to provide a nonlegal technical statement adapted to serve as a searching-scanning tool for scientists, engineers and researchers. Accordingly, this abstract is not intended to limit the scope of the invention, hereinafter described in detail, nor is it intended to be used in interpreting or in any way limiting the scope or fair meaning of the claims appended hereto.

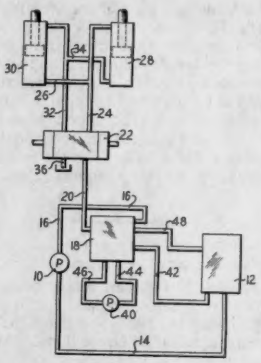
3,613,817
LINKAGE MECHANISM ACTUATING HYDROSTATIC TRANSMISSIONS SEPARATELY DRIVING THE FRONT WHEELS OF A TRACTOR
Emmett F. Glass, Akron, and Bruce D. Schwalm, Leola, both of Pa., assignors to Sperry Rand Corporation, New Holland, Pa.
Filed Oct. 28, 1969, Ser. No. 871,846
Int. Cl. B62d *11/04*
U.S. Cl. 180—6.48 **12 Claims**

A linkage mechanism actuates two hydrostatic transmissions separately driving the two front wheels of a tractor and has a spring-biased operating lever pivotally and rotatably mounted on the main frame and two links connected between a single-bearing ball on the lever to separate bearing balls on respective pintle arms of the hydraulic transmission pumps. The lever and links actuate the pintle arms over forward and reverse. Releasable holding means retain the lever at any given forward drive position and, on release, the spring bias returns the lever to neutral as braking is applied to the driving hydraulic motors. Pivotally mounted neutral stop arms prevent the pintle arms from moving from forward to reverse drive and are raised clear of



the pintle arms by a pedal pivotally coupled to the neutral stop arms to permit reverse movement.

3,613,818
EMERGENCY SUPPLY SYSTEM FOR VEHICLE HYDRAULIC COMPONENTS
George Schubert, Aurora; Lloyd D. Swayze, Yorkville, and John B. Waggoner, Joliet, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.
Filed Sept. 4, 1969, Ser. No. 855,343
Int. Cl. B62d *5/06*
U.S. Cl. 180—79.2 R **7 Claims**

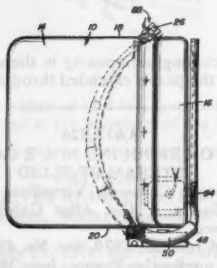


An emergency supply of fluid under pressure to the hydraulic system of a vehicle with a normal supply derived from a primary source of pressure such as an engine-driven pump. Pressure for the emergency system is derived from a secondary source or wheel-driven pump to insure a supply upon engine failure and whenever the vehicle is in motion. Flow from the emergency system supplements or replaces that in the normal system whenever the normal system flow falls below a predetermined value. Automatic valves also prevent flow from either system toward an idle pump or rupture in the other system.

3,613,819
RETRACTABLE SEATBELT ASSEMBLY
Walter H. Maloney, 520 Ascot Ridge, Rock Hill, S.C.
Filed Mar. 20, 1970, Ser. No. 21,234
Int. Cl. B60r *21/10*
U.S. Cl. 180—82 **9 Claims**

An elongated arcuate support structure composed of telescopingly engaged short arcuate tubular sections

extendible and retractable relative to each other between retracted positions disposed at one side of an associated vehicle seat structure and extended positions extending across the associated seat structure in the manner of a seatbelt structure. A drive assembly is provided for extending and retracting the elongated support structure and the drive assembly includes a control assembly for automatically actuating the drive assembly to extend and retract the support structure each time an associated vehicle ignition switch is turned on and also when the ignition switch is turned off. A spring reel mounted protractable seatbelt assembly is disposed alongside the support structure and the extendible end of the latter includes a clamp releasably frictionally engageable with the extendible end of the seatbelt



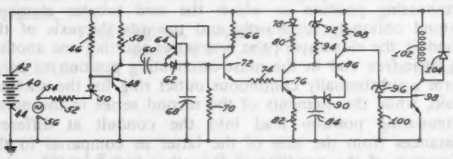
for protracting the latter upon extension of the support structure and retracting the seatbelt upon retraction of the support structure. However, an anchor assembly is supported adjacent the other side of the associated seat structure and includes a clamp structure operable to automatically anchor the protractable end of the seatbelt when initially advanced there toward whereby the seatbelt will be securely anchored and subsequent retraction of the support assembly will be accomplished independent of retraction of the seatbelt. The anchor assembly further includes means whereby the next protraction of the support structure to its extended position will automatically release the protracted end of the seatbelt for retraction together with the support structure upon its next subsequent retraction.

3,613,820

ELECTRONIC CIRCUITRY FOR VEHICLE SPEED RESPONSIVE SYSTEM

Michael Bozoian, Ann Arbor, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Aug. 28, 1969, Ser. No. 853,905
Int. Cl. B60k *31/00*
U.S. Cl. 180—105 **4 Claims**



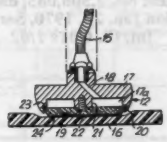
Electronic circuitry coupled to an alternating signal generator driven by a vehicle wheel converts the alternating signal into a voltage that is proportional to vehicle speed. When the voltage reaches a predetermined value, the circuitry produces a signal that actuates an item of vehicle equipment. A voltage reference diode compensates the electronic circuitry for variations in the voltage provided by the vehicle energy source to produce a system having an accuracy of about 2 percent over a vehicle speed range up to 100 m.p.h. and with source voltage variations of 10–20 volts. Other diodes compensate the circuitry for temperature variations.

3,613,821

LOAD-SUPPORTING DEVICE

John Kerr, Cambuslang, Glasgow, Scotland, and Ian Lasbrey, Belfast, Northern Ireland, assignors to National Research Development Corporation, London, England

Filed Feb. 27, 1969, Ser. No. 802,840
Claims priority, application Great Britain, Mar. 2, 1968, 10268/68
Int. Cl. B60v *1/00*
U.S. Cl. 180—125 **9 Claims**



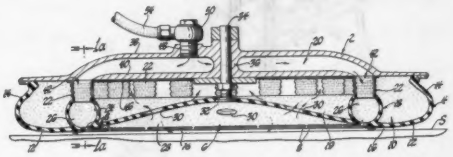
A load-supporting device comprising at least one air cushion lifting pad in combination with a compliant ground-effect surface provided by elastomeric material, and means for supplying pressurized fluid to each pad to form a fluid cushion between each pad and the compliant surface.

3,613,822

COMBINED PLENUM CHAMBER AND JET CURTAIN AIR CUSHION DEVICE

Harry A. Mackie, Raleigh, N.C., and Howard R. Ross, Grosse Pointe Woods, Mich., assignors to Transportation Technology, Inc., Madison Heights, Mich.

Filed Aug. 22, 1969, Ser. No. 852,286
Int. Cl. B60v *1/02, 1/16*
U.S. Cl. 180—128 **12 Claims**



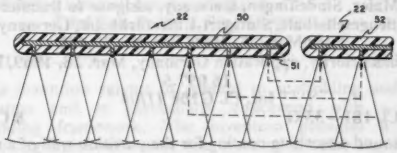
An air cushion device including a rigid base with means in the form of a flexible diaphragm defining a plenum chamber beneath the base for confining a first cushion of air to support the device above a surface at heights within a first range when relatively low-pressure, superatmospheric air is supplied to the plenum chamber; and nozzle means for providing a jet curtain of high-pressure air operable to confine a second cushion of air to support the device above the surface at heights within a second range greater than the first range of heights when relatively high-pressure air is supplied to the nozzles.

3,613,823

DOUBLE-BUBBLE SPARK ARRAY

Eric C. Burrage, Pearland, Tex., assignor to Shell Oil Company, New York, N.Y.

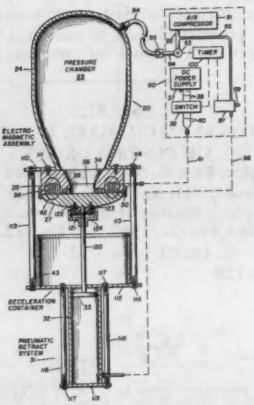
Filed June 30, 1969, Ser. No. 837,797
Int. Cl. G01v *1/00*
U.S. Cl. 181—0.5 **6 Claims**



A spark-type seismic sound source for use in water-

covered areas wherein electrical power is discharged through a plurality of electrodes without the use of a ground plate.

3,613,824
PNEUMATIC ACOUSTIC SOURCE EMPLOYING ELECTROMAGNETICALLY CONTROLLED VALVE
George B. Loper, Duncanville, Tex., assignor to Mobil Oil Corporation
Continuation-in-part of application Ser. No. 663,800, Aug. 28, 1967, now Patent No. 3,506,085, dated Apr. 14, 1970. This application Jan. 27, 1970, Ser. No. 6,092
Int. Cl. G01v *1/02*
U.S. Cl. 181—.5 **4 Claims**



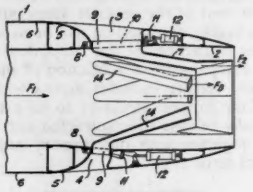
The specification discloses an acoustic source having a chamber for receiving gas. A valve is provided for confining gas under pressure in the chamber. An electromagnet is employed for holding the valve in its closed position and for releasing the valve to release the pressurized gas from the chamber by way of a port extending through the electromagnet. In the valve's closed position, a seal is formed between the two opposing surfaces of the electromagnet and the valve around the port and spaced inwardly from the outer boundaries of the two surfaces. In the preferred embodiment, a cylindrical member is supported to extend from the electromagnet and to surround the valve when it is in its closed position. A clearance exists between the outer periphery of the valve and the inside diameter of the cylinder whereby there is a lack of fluid seal formed between the cylinder and the valve.

3,613,825
SOUND-ABSORBING COATING FOR THE PARTITION WALL OF A MOTOR VEHICLE
Rolf Maier, Sindelfingen, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany
Filed Mar. 25, 1970, Ser. No. 22,485
Claims priority, application Germany, Mar. 28, 1969, P 19 16 097.5
Int. Cl. G10k *11/04*
U.S. Cl. 181—33 G **8 Claims**

A sound-absorbing coating for the partition wall of a motor vehicle in which the partition wall and coating are provided with substantially aligned openings for the passage therethrough of a part such as a cable, a pipe, a linkage or the like; the coating is provided on the surface opposite the partition wall with an elastic cover which closes off the

opening in the coating; an opening in the cover is elastically expanded when the part is extended through the same.

3,613,826
SYSTEM FOR REDUCING NOISE CAUSED BY A STREAM OF FLUID
Andre Emile Roger Cabassut, Versailles, Yvelines, France, assignor to Bertin & Cie, Allee Gabriel-Voisin, Plaisir, Yvelines, France
Filed June 25, 1970, Ser. No. 49,857
Claims priority, application France, June 30, 1969, 69 21 997
Int. Cl. B64d *33/06*
U.S. Cl. 181—33 HC **9 Claims**



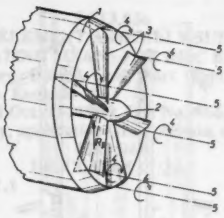
A system for reducing noise caused by a stream of fluid comprises a fluid ejection conduit comprising two series of ambient fluid intake vents distributed around its periphery; and

Two series of orientatable tubular elements respectively connected to the said vents and arranged to occupy two positions, namely a retracted position in which they are folded back adjacent the inner wall of the conduit and form along the latter a substantially continuous ring bounding a continuous passage for the stream of fluid, and a noise-attenuating position in which the said tubular elements extend obliquely rearwardly and towards the axis of the conduit, the elements of the first series abutting one another at their free end in the noise-attenuating position so as to form a substantially continuous outlet ring for the ambient fluid, while the elements of the second series in the noise-attenuating position lead into the conduit at different distances from the axis of the latter as compared to the distances of the conduits of the other series in the noise-attenuating position.

3,613,827
DEVICE FOR ATTENUATING NOISE EMITTED BY THE JET OF A JET ENGINE
Andre Labussiere, Fontenay-le-Fleury, France, assignor to Avions Marcel Dassault, Vaucresson, France
Filed July 8, 1970, Ser. No. 53,224
Claims priority, application France, July 16, 1969, 69 24196
Int. Cl. F01n *1/08;* **B64d** *33/06*
U.S. Cl. 181—33 HC **7 Claims**

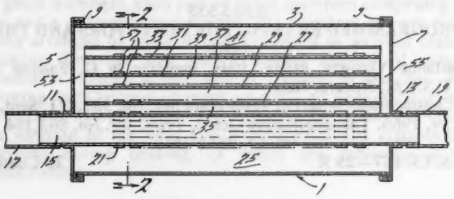
The noise emitted by the jet of a jet engine is suppressed or

in any event attenuated by a blading fitted in the exit section of the jet engine nozzle and designed with a lift-producing



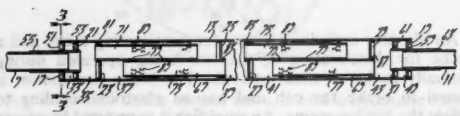
profile adapted, by virtue of said lift, to create a series of tip vortices level with and at the periphery of the blading.

3,613,828
MULTILOUVER ROUGHNESS SILENCER
Bert DuBois, Brooklyn, Mich., assignor to Tenneco Inc., Racine, Wis.
Filed July 27, 1970, Ser. No. 58,394
Int. Cl. F01n *1/04, 1/10*
U.S. Cl. 181—48 **5 Claims**



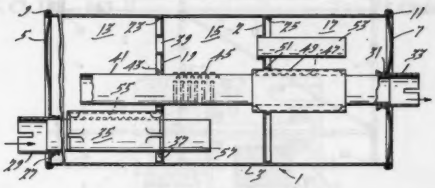
A muffler has a sinuous louvered partition extending longitudinally of the casing and alongside a straight-through gas flow tube to provide a series of expansion chambers that are in parallel with the gas flow through the muffler.

3,613,829
DOUBLE TRIFLOW MUFFLER
Charles L. Palmer, Munith, Mich., assignor to Tenneco Inc., Racine, Wis.
Filed Aug. 26, 1970, Ser. No. 67,062
Int. Cl. F01n *1/08, 7/18*
U.S. Cl. 181—53 **6 Claims**



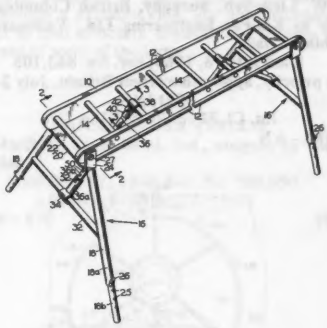
An exhaust muffler for external side mounting on sports cars comprises an elongated tubular housing having internal partitions which carry two pairs of overlapping perforated gas flow tubes separated by a central expansion chamber to provide a series arranged, double triflow pattern for gas flow and sound silencing.

3,613,830
ONE-PIECE TUBE AND SHELL ASSEMBLY FOR SILENCER
Franklin R. Hubbell, III, Brooklyn, Mich., assignor to Walker Manufacturing Company, Racine, Wis.
Filed July 18, 1969, Ser. No. 843,100
Int. Cl. F01n *1/02, 7/18;* **B21d** *53/06*
U.S. Cl. 181—54 **12 Claims**



A T-shaped blank is rolled into telescoped inner and outer tubes to form a tube-and-shell assembly of a type that may be used in exhaust mufflers for internal-combustion engines as a spit chamber and gas flow tube or as a pair of tuning tubes.

3,613,831
LADDER SCAFFOLD
Everett C. Estep, 313 N.E. 99th St., Vancouver, Wash.
Filed Oct. 27, 1969, Ser. No. 869,614
Int. Cl. E04g *1/00;* **E06c** *7/42*
U.S. Cl. 182—27 **3 Claims**

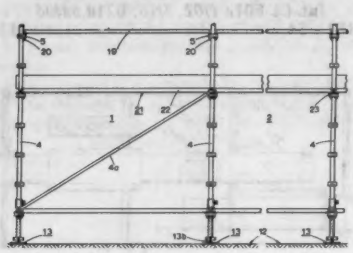


A scaffold is provided which employs as its platform portion a conventional straight-type ladder. The invention includes a pair of end leg assemblies each having a channel-shaped upper head portion for receiving end portions of the ladder therein and for connecting the leg assemblies to the ladder. The leg assemblies have a reinforcing crosspiece from which a strut angularly extends. Such struts have clamps at their free end for releasably engaging rungs of the ladder for holding the leg assemblies in fixed position relative to the ladder.

3,613,832
SCAFFOLDING
Frederick H. Dunster, London, England, assignor to Big Ben Scaffolding Limited, London, England
Filed Feb. 9, 1970, Ser. No. 9,662
Int. Cl. E04g *1/08*
U.S. Cl. 182—179 **6 Claims**

This invention relates in general to scaffolding and like structures and is particularly concerned with a unit scaffolding framework. The invention provides a unit scaffolding framework with four vertical tubular standards. Clamps are spaced along the standards. Each clamp has two shaped members held together against resilient opposition by a bolt passing through the standard to which the clamp is

attached. Baseplates are adjustably mounted in relation to the lower ends of respective standards. A horizontal ledger is connected with two of the standards by the clamps. A diagonal bracing tube is connected with two of the standards so as to lie in a plane parallel to a wall or a site of a wall to be

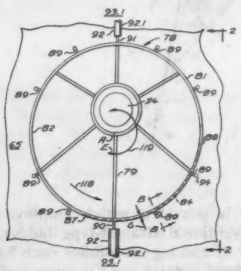


built. A cross-bracing tube is connected with two of the standards so as to lie in a plane transverse to the wall or wall site. A horizontal transom of inverted T-cross section is connected with two of the standards so as to lie perpendicularly to the wall or wall site. A further horizontal transom of inverted T-cross section is similarly connected with the other two of the standards. Horizontal platform boards are laid on, and extending between, the two transoms to form platforms for workmen.

3,613,833
INTERNAL COMBUSTION ENGINE LUBRICATION MEANS

Leopold W. Llewellyn, Burnaby, British Columbia, Canada, assignor to Kal-Pac Engineering Ltd., Vancouver, British Columbia, Canada

Filed July 18, 1969, Ser. No. 843,105
Claims priority, application Great Britain, July 24, 1968, 35213/68
Int. Cl. F01m 9/06; F16n 7/36
U.S. Cl. 184—6 N **5 Claims**



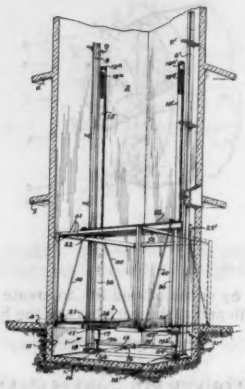
A lubrication system for small high-speed internal combustion engines including a crankshaft and an oil reservoir. Wick feed is used to convey oil to a grooved rotor picking up the oil and discharging it by centrifugal force through passages leading to lubrication points.

3,613,834
ELEVATOR LIFT

Frank Howard Field, 133 E. Virginia Blvd., Jamestown, N.Y.

Filed Aug. 28, 1969, Ser. No. 853,748
Int. Cl. B66b 11/04
U.S. Cl. 187—17 **6 Claims**

A pair of lifting cylinders are arranged laterally of an elevator car to be lifted thereby; each of the cylinders comprising a stationary piston and an extensible plunger cylinder slidably carried thereon. The elevator car is supportably positioned below the upper end of the plunger cylinder for vertical movement therewith so as to permit the length of that portion of the lifting cylinder which projects above the car to be varied in accordance with height through which the car is to be lifted. The elevator car is provided with pairs of vertically spaced guide assemblies adapted to cooperate with a pair of guide rails extending vertically of the

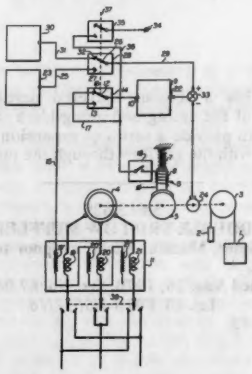


intended path of elevator travel. Each plunger cylinder is received within one pair of guide assemblies for purposes of stabilizing the elevator car and provided with a ring member on which one of the assemblies is mounted for purposes of supporting the elevator car.

3,613,835
PROGRAMMED BRAKING FOR ELEVATORS AND THE LIKE

Raffaello Vizzotto, Milan, Italy, assignor to G. Falconi & C.S.p.A., Novara, Italy

Continuation-in-part of application Ser. No. 582,871, Sept. 29, 1966. This application Oct. 2, 1969, Ser. No. 863,186
Int. Cl. B66b 1/32
U.S. Cl. 187—29 R **20 Claims**



An elevator includes a motor for accelerating a cab and a brake for decelerating it, the two being operated during mutually exclusive time intervals. The brake mechanism is biased to brake the cab and has an electrical winding to defeat the biasing spring. An amplifier is connected by means of a selector switch to control energization of the motor during acceleration and of the brake winding during deceleration. The input to the amplifier comes from a summing network which develops the difference between two control signals. One of the control signals comes from a tachometer generator and is proportional to the speed of the elevator car, while the other control signal comes from a brake program device or an acceleration program device. The program devices are designed to provide braking and

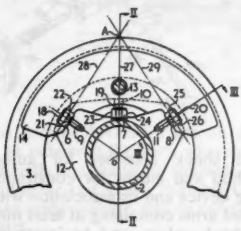
acceleration programs respectively which are functions of the distance of the elevator car from a particular floor. During deceleration the braking effort is smooth and continuous right up to the moment of dead stop.

3,613,836

FRICTION ELEMENT ASSEMBLY SUPPORT AND ACTUATING MEANS FOR DISC BRAKES

Frederick Sidney Dowell, c/o Fort Dunlop, Erdington, Birmingtion 24, England

Filed Oct. 15, 1969, Ser. No. 866,666
Claims priority, application Great Britain, Oct. 15, 1968, 48805/68
Int. Cl. F16d *55/224*
U.S. Cl. 188—71.1 **9 Claims**



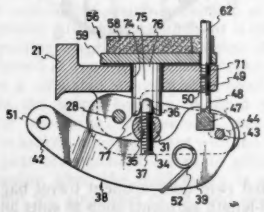
A disc brake in which the friction element assemblies, which are arranged to engage a minor proportion of the disc area, are guided into engagement with the disc on three pairs of guide members, each pair of guide members comprising a key and a corresponding keyway, the members of each pair being arranged to allow sliding movement in an axial brake applying direction and also a limited amount of radial movement relative to the axis of rotation of the disc, so allowing each friction element assembly to align itself in its own plane to compensate for inaccuracies in manufacture, the location of the keys and deformations and expansions occuring during braking, of which the following is a specification.

3,613,837

MECHANICAL BRAKE SYSTEM OF DISC-TYPE

Kaoru Tsubouchi, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Dec. 11, 1969, Ser. No. 884,121
Claims priority, application Japan, Dec. 21, 1968, Dec. 27, 1968, 43/093884;44/000154
Int. Cl. F16d *55/224*
U.S. Cl. 188—72.9 **6 Claims**



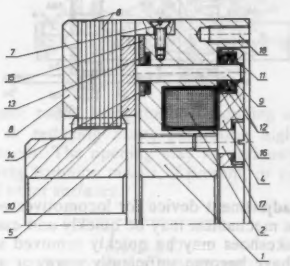
A mechanical brake system for use with a hydraulic disk-type brake device as a parking or emergency brake wherein the mechanical brake comprises a C-shaped caliper swingably mounted above the hydraulic disk brake, a pair of friction linings provided in the caliper on mutually opposite flat sides of the rotatable disk and adapted to engage therewith, a pair of lever plates pivotally mounted on the caliper, lining pressing means pivotally mounted on the lever plates and adapted to engage with one of the linings when the mechanical brake is applied independently of the hydraulic disk-type brake.

3,613,838

AUTOMATIC ADJUSTING DEVICE FOR CLUTCHES AND BRAKES

Karl-Heinz Pape, Kleinenbremen, Germany, assignor to Maschinenfabrik Hans Lanze KG, Bosingfeld Lippe, Germany

Filed Apr. 2, 1970, Ser. No. 25,084
Claims priority, application Germany, Apr. 21, 1969, P 19 20 127.5
Int. Cl. F16d *65/52, 13/75*
U.S. Cl. 188—163 **5 Claims**



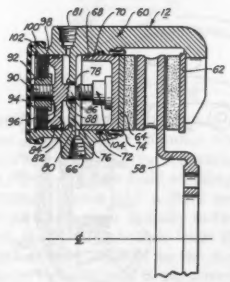
In an electromagnetic brake, clutch or the like, an automatic adjusting device compensating for the wear of the friction elements includes an armature arbitrarily movable towards and away from said friction elements; pressure bolts held in said armature and in an adjacent stationary member by unidirectionally locking spring elements so that the pressure bolts, adapted to exert a force on said friction elements through a pressure ring, are automatically moved with respect to said armature towards said friction elements by the amount of wear of the latter.

3,613,839

VEHICLE BRAKE SYSTEM

Stanley I. MacDuff, South Bend, Ind., assignor to The Bendix Corporation

Filed Dec. 31, 1968, Ser. No. 789,050
Int. Cl. F16d *65/24, 55/22*
U.S. Cl. 188—170 **10 Claims**

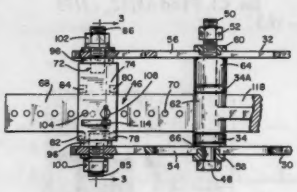


A disc brake is disclosed which includes a housing defining a bore therewithin which is divided into two compartments by an annular wall. A first piston is slidably mounted in one of the compartments and is adapted to urge a friction member against a rotor upon a brake application. A second piston is mounted in the other compartment. Resilient means yieldably urge the second piston into engagement with the first piston and thereafter urge the first and second piston as a unit toward the rotor. The resilient means is normally opposed by fluid pressure to permit the first piston to apply the brakes of the vehicle when the latter is in motion and the vehicle hydraulic system is functioning normally.

3,613,840
QUICK SLACK ADJUSTER FOR LOCOMOTIVE BRAKES

Roy Henry Touchstone, P. O. Box 2003, Jackson, Tenn.

Filed Apr. 10, 1969, Ser. No. 815,062
Int. Cl. F16d 65/44
U.S. Cl. 188—197 5 Claims

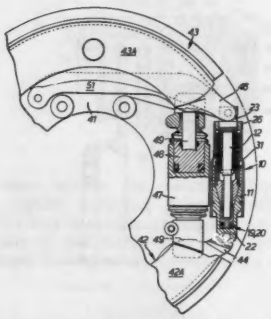


A brake adjustment device for locomotives wherein slack in the brake mechanism may be quickly and easily adjusted, and the brakeshoes may be quickly removed and replaced when they have become sufficiently worn, or are otherwise damaged or in need of repair. The adjustment device includes an apertured slide bar connected with a brake lever and extending through a trunnion carried by the pull rods whereby the brake may be quickly adjusted by pulling the slide bar through the trunnion and securing the bar in the proper position by inserting a keeper pin through the slide bar and trunnion. In addition, the slide bar device facilitates release of the brake lever to provide for a quick clearance between the brakeshoe and wheel, thus reducing the time required for the replacement of worn brakeshoes.

3,613,841
LOCKING MEANS FOR VEHICLE WHEEL BRAKES

Charles Newstead, Tyseley, England, assignor to Girling Limited

Filed Apr. 13, 1970, Ser. No. 27,873
Claims priority, application Great Britain, Apr. 11, 1969, 18,764/69
Int. Cl. F16d 51/00
U.S. Cl. 188—265 6 Claims

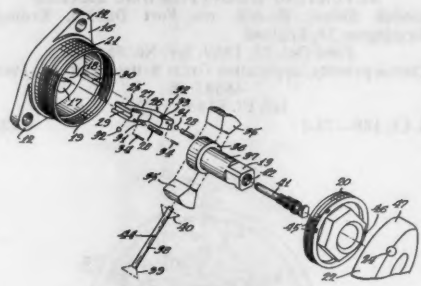


A drum brake of the type having carriers which transmit thrust from a wheel cylinder to the brake shoes is provided with a locking unit comprising a telescopic strut connected between the carrier and lockable in an extended condition to prevent shoe retraction. Overloading of the strut is prevented by a resilient overload device acting in series with the strut, and a pivoted lever operated by the wheel cylinder makes it possible to relieve the locked strut of the load transmitted by the overload device, thereby facilitating unlocking of the strut.

3,613,842
HYDRAULIC ARCUATELY OSCILLATING SHOCK ABSORBER

Peter Buciak, 2144 W. Superior St., Chicago, Ill.

Filed Aug. 11, 1969, Ser. No. 848,917
Int. Cl. F16d 57/02
U.S. Cl. 188—306 3 Claims

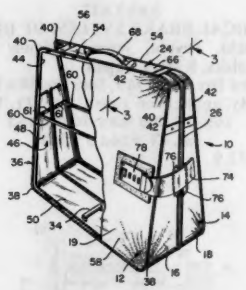


A hydraulic shock absorber for automobiles having improved method and means for constructing the base or chamber of the device and its association with a pair of fixed radially disposed arms containing at least one or an opposed pair of ball check valves, and to improved methods and means for making rotary wing shafts supporting impeller wings for disposition between said fixed arms.

3,613,843
CENTER FOLDED TRAVEL BAG

Michael Davis, Little Neck, N.Y., assignor to Mayfab, Inc., Brooklyn, N.Y.

Filed Dec. 29, 1969, Ser. No. 888,754
Int. Cl. A45c 13/36
U.S. Cl. 190—50 11 Claims



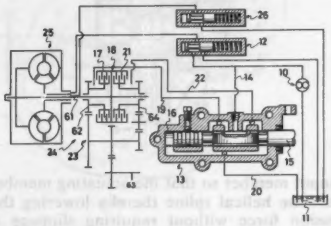
A center-folded twin compartment travel bag is provided for carrying full-length garments such as suits and dresses. A slide fastener detachably joins the compartments around registered open mouths thereof and when opened exposes the interior of the bag so that unfolded suits and dresses may be suspended by a centrally located transverse support. In its open position, the bag may be hung from an end to serve as a portable, semienclosed wardrobe. Each compartment includes a soft base panel whose edges are secured to a rectangular wire frame. When the slide fastener closes the bag, the wire frames are in a sawhorse (opposed diverging) configuration with a top slat joining the parallel upper reaches of each frame. The slat terminates short of both ends of each reach.

3,613,844

FORWARD-REVERSE AND BRAKE CONTROL VALVE

Tadao Asano, Kariya; Hiroji Yamaguchi, Kariya, and Kazuo Ishikawa, Hoi gun, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Nov. 25, 1969, Ser. No. 879,675
Claims priority, application Japan, Nov. 30, 1968, 43/87854
Int. Cl. F16d 67/04
U.S. Cl. 192—4 C 9 Claims



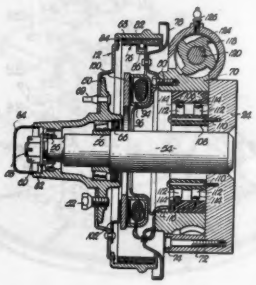
A transmission control device for use on a self-propelled vehicle such as an industrial lift truck wherein a changeover valve connected both to a manually shiftable lever and to a brake pedal is rotatable and axially shiftable thereby so as to have clutch means communicate with or cutoff from a source of pressurized fluid.

3,613,845

CLUTCH OR BRAKE WITH ELECTRIC PILOT CLUTCH

William L. Hollander, Centralia, Mo., assignor to A. B. Chance Co., Grandview, Mo.

Filed Oct. 6, 1969, Ser. No. 863,874
Int. Cl. F16d 43/20
U.S. Cl. 192—8 R 6 Claims



A combination brake and drive apparatus for a low-speed high-torque vehicle but which is capable of being towed at unlimited speeds. A braking component is engageable with a vehicle-supporting wheel assembly to slow the vehicle when it is being towed at road speeds. The braking component is mounted on a rotatable worm wheel which is driven by a worm within the worm housing. A fluid motor turns the worm screw to drive the vehicle when the braking component is locked in engagement with the wheel assembly. The worm gear arrangement serves to effectively lock the drive mechanism when the fluid motor is not operating to thereby permit the apparatus to be used solely as a braking mechanism.

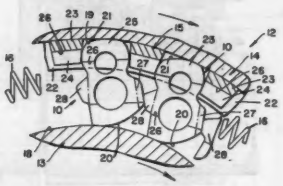
3,613,846

HOLLOW SPRAG

Thaddeus F. Zlotek, Center Line, Mich., assignor to Formsprag Company, Warren, Mich.

Filed Jan. 12, 1970, Ser. No. 2,078
Int. Cl. F16d 41/07
U.S. Cl. 192—41 A 5 Claims

A torque-transmitting sprag, otherwise solid in cross section, has one or more openings extending substantially throughout the axial length thereof between shaped working surfaces at which it engages coaxial clutch races, and front and rear surfaces of the sprag. The opening reduces the sprag weight, governs the location of its center of gravity and, more importantly, enables the sprag to flatten slightly at the race



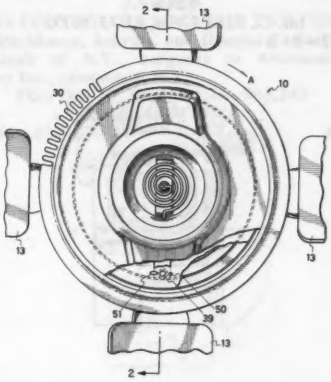
surfaces, under radial load, thereby reducing unit internal stress and, in reducing mass, permitting higher efficient operating speeds. The opening may be variously located in regard to sprag trunnion means, if present, or to the sprag's working and other surfaces.

3,613,847

FLUID DRIVE COUPLING

Hiroto Masai, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Dec. 12, 1969, Ser. No. 884,604
Claims priority, application Japan, Dec. 21, 1968, 43/93885
Int. Cl. F16d 31/08, 35/00
U.S. Cl. 192—58 B 5 Claims



A fluid-coupling device of temperature responsive type for automotive use, wherein fluid chamber means constituted by an output member is divided by a partition plate supported by the output member into a fluid-working chamber carrying an input member therein and a fluid reservoir or storage chamber, the partition plate radially outward comprising an impact portion, a discharge hole in front thereof and an inlet opening in back thereof relative to the direction of the inlet hole or discharge opening and being covered by a valve arm disposed axially and operated thermostatically so as to control the volume of viscous fluid supplied to the driving rotor.

3,613,848

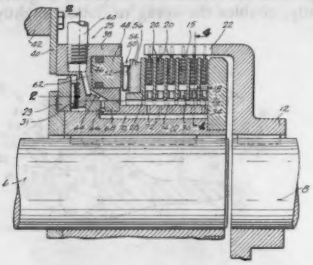
FLUID ACTUATED AND LUBRICATED CLUTCH WITH SPLINED RELEASE SPRINGS

Donald H. Reiff, Cedarburg, Wis., assignor to Stearns Electric Corporation, Milwaukee, Wis.

Filed Sept. 15, 1969, Ser. No. 857,867
Int. Cl. F16d 25/00
U.S. Cl. 192—70.28 6 Claims

A stack of coupling disks for frictionally clutching relatively rotatable shafts has interleaved convoluted springs

splined to the shafts for clutch release. The disks are subjected to fluid pressure through a needle bearing from a



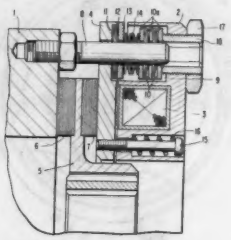
relatively fixed ram. A separate source of liquid is conducted from a fixed portion of the ram into one of the relatively movable clutch parts and fed to various disks of the stack.

3,613,849

AUTOMATIC ADJUSTING DEVICE FOR CLUTCHES AND BRAKES

Karl Heinz Pape, Kleinenbremen, Germany, assignor to Maschinenfabrik Hans Lenze KG, Bosingfeld, Lippe, Germany

Filed Mar. 27, 1970, Ser. No. 23,280
Claims priority, application Germany, Apr. 21, 1969, P 19 20 128.6
Int. Cl. F16d *27/08*, *13/75*, *65/52*
U.S. Cl. 192—84 B 4 Claims



In a brake or clutch with electromagnetic release, an automatic-adjusting device, compensating for the wear of the friction elements, includes an armature and an adjacent magnetic core both axially slidable on guiding bolts towards and away from said friction elements, said adjusting device further includes locking elements which permit said magnetic core to slide freely on said guide bolts only towards said armature and which permit said armature to slide freely on said guide bolt towards said friction elements, but to slide towards said magnetic core only the distance of the armature stroke.

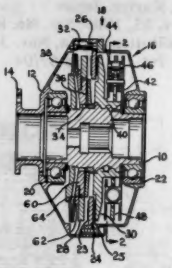
3,613,850

CENTRIFUGAL AND TORQUE RESPONSIVE CLUTCH

Henry Troeger, Cooperstown, N.Y., assignor to The Bendix Corporation, Utica, N.Y.

Filed Aug. 26, 1969, Ser. No. 853,021
Int. Cl. F16d *43/06*
U.S. Cl. 192—105 CP 7 Claims

A self-energizing torque limiting, governor-controlled disk clutch is disclosed herein. The clutch is an actuating member which advances on a helical spline to compress a disk pack in response to the speed-sensitive governor. Initial contact between the actuating member and the disk-pack member causes the actuating member to fully advance and lock into engagement with the disk pack. Means are provided to permit counterrotation of the disk pack when the rotational speed of the clutch output member exceeds the speed of the



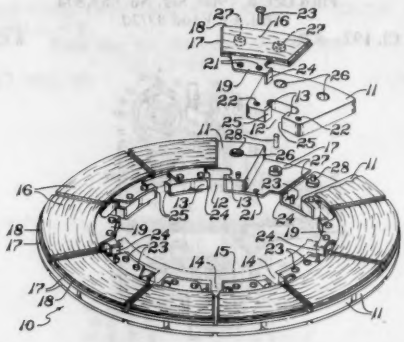
clutch input member so that the actuating member can begin to retract the helical spline thereby lowering the disk-pack compression force without requiring slippage of the disk pack.

3,613,851

SEGMENTED FRICTION MEMBER FOR BRAKE OR CLUTCH

William Edwin Ely, and Ralph R. Main, both of Troy, Ohio, assignors to The B. F. Goodrich Company, New York, N.Y.

Filed Aug. 4, 1969, Ser. No. 847,030
Int. Cl. F16d *13/60*
U.S. Cl. 192—107 R 7 Claims



A segmented friction member for a disc-type brake or clutch in which segmental facing members overlap heat-absorbing segments keyed to the rotating or nonrotating structure. The facing members are connected to the heat absorbing segments to form an annulus and also have interlocking members extending through the heat-absorbing segments to resist turning relative to the segments. Protection of the heat-absorbing segments from wear and high stresses is provided by the facing members in the area of frictional engagement and in the area where the segments are keyed to the rotating or nonrotating structure for transmitting torque thereto.

3,613,852

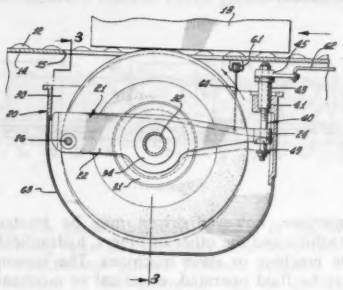
RELEASABLE MOUNTING FOR POWER WHEEL

John G. Schwarzbeck, Downey, Calif., assignor to Western Gear Corporation, Lynwood, Calif.

Filed July 28, 1969, Ser. No. 845,174
Int. Cl. B65g *13/02*
U.S. Cl. 198—127 R 5 Claims

Releasable mounting for a power wheel in a conveyor system which features a cargo-moving assembly wherein the wheel is normally sustained in elevated position to make

traction engagement with the bottom of the cargo, and in case of power failure or other emergency the mounting can be quickly and remotely actuated to drop the wheel out of contact with the cargo.

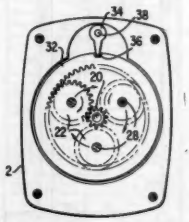


3,613,853

ROTARY SHAFT TORQUE-LIMITING DEVICE

Harley E. Linthicum, and William B. Bronne, both of Springfield, Ohio, assignors to Carrier Corporation, Syracuse, N.Y.

Filed Sept. 2, 1969, Ser. No. 854,670
Int. Cl. B25b *23/14*; F16h *57/10*
U.S. Cl. 192—150 **8 Claims**



A torque controlled air tool employing a planetary gear set, one element of which is held stationary by magnetic means. A snap action of the linkage between the magnet and the stationary element is obtained when the force exerted on the stationary element exceeds the magnetic holding force, the snap action of the linkage being utilized to shut off the air supply to the tool.

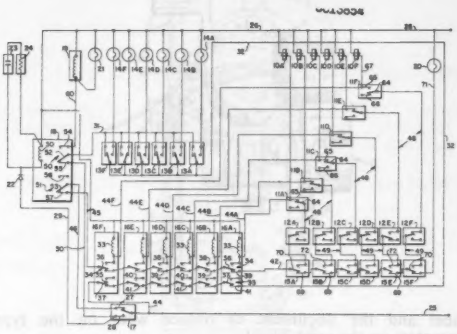
3,613,854

CHECK CONTROLLED VEND RELAY TIMING CIRCUIT

Raymond D. Bowman, Ringgold, Ga., assignor to The Seeburg Corporation, Chicago, Ill.

Filed Oct. 30, 1969, Ser. No. 872,489
Int. Cl. G07f *11/00*
U.S. Cl. 194—10 **19 Claims**

A timing circuit provides an auxiliary source of energization for a vend relay of a multiselection coin operated vending machine wherein dispensing from one of a plurality of columns is controlled by selective energization of a dispensing solenoid. The operating coil of a selected dispensing solenoid is energized upon actuation of a selection switch adapted to be connected in circuit with a pair of normally open contacts of the vend relay which contacts are closed upon energization thereof. A timing capacitor is connected in parallel with the operating coil of the vend relay. The charging circuit of the capacitor is through the hold circuit for the vend relay. The capacitor, upon operation of a vend select switch, which causes energization of a corresponding vend solenoid and deenergization of the vend relay hold circuit, discharges through the operating coil of the vend relay to thereby cause the vend relay to remain energized for a fixed period after the select switch has been actuated.

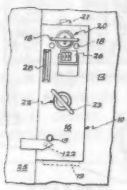


3,613,855

COIN CONTROLLED LOCK FOR TWO COINS

Wells F. Stackhouse, Ashville, and Douglas A. Barth, Bemus Point, both of N.Y., assignors to American Locker Company Inc., Jamestown, N.Y.

Filed Oct. 10, 1969, Ser. No. 865,243
Int. Cl. G07f *17/14*
U.S. Cl. 194—51 **11 Claims**



A key lock operable only by two properly sized coins, such as quarters, deposited through a common slot including a switch mechanism operable to automatically direct the properly sized coins sequentially into outer and inner coin receiving positions; the presence in the inner receiving position of a properly sized coin permitting operation of the lock. Smaller sized coins deposited in any sequence relative to the two properly sized coins or excess properly sized coins are permitted to fall through the lock without influencing its operation.

3,613,856

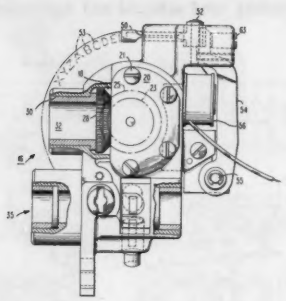
ANTIWEAR SHIELD FOR CONTINUOUSLY ROTATABLE-TYPE DISC PRINTER

David W. Reed, Endicott, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 27, 1968, Ser. No. 787,451
Int. Cl. B41j *19/04*; B41; *1/26*
U.S. Cl. 197—54 **2 Claims**

In a printer having a continuously rotating flexible print wheel or disc and a hammer for impacting the print wheel into engagement with a document of the pressure-sensitive

type which is backed by a platen, a flexible antiwear member is mounted to rotate with the print wheel between the print



wheel and the document to reduce wear on the type characters on the print wheel.

3,613,857

RIBBON TRANSPORTING AND SHIFTING MECHANISM

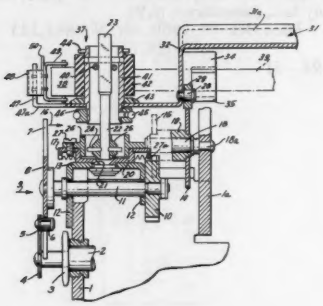
Paul Thevis, Oberndorf; Artur Frobel, Oberndorf, and Oskar Stoll, Aistaig, all of Germany, assignors to Olympia Werke Aktiengesellschaft, Wilhelmshaven, Germany

Filed July 10, 1969, Ser. No. 840,809

Claims priority, application Germany, July 13, 1968, P 17 61 847.2

Int. Cl. B41j *33/14, 33/58*

U.S. Cl. 197—151 **9 Claims**



The carbon ribbon of a calculator having a line printer, is mounted on a carrier and stepwise transported in longitudinal direction past the line printer, while a multiple cam cyclically moves the carrier with the ribbon in transverse direction between three positions since three times the height of the types of the line printer correspond to the width of the ribbon. In order to fully utilize the ribbon, it is longitudinally advanced in connection with each printing operation, a distance which is substantially equal to the length of the line printer divided by three.

3,613,858

SYSTEM OF DRIVING A PLURALITY OF MACHINES

Victor Ian Malcolm Cox, Woodford Wells, England, assignor to Albro Fillers and Engineering Company Limited, Ponders End, Middlesex, England

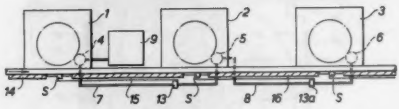
Filed Jan. 27, 1969, Ser. No. 794,220

Claims priority, application Great Britain, Feb. 1, 1968, 5278/68

Int. Cl. B65g *37/00*

U.S. Cl. 198—19 **7 Claims**

A system of synchronizing the drive of a plurality of machines comprising means for sensing when the machines are running out of synchronism and valve means operative in response thereto for controlling the flow of hydraulic medium to which the drive of at least one of the machines responds to restore synchronism, more particularly applied to the flow treatment of articles, such as containers, through successive machines.



One machine, however driven may be treated as the master machine and the other or others, hydraulically driven as a slave machine or slave machines. The sensing means, which may be fluid operated, electrical or mechanical, may respond to relative motion between rotary monitoring components driven by the respective machines or to the articles themselves.

3,613,859

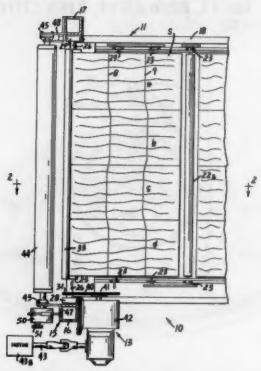
INDEXING CROSSBAND VENEER FOR AUTOMATIC PLYWOOD LAYUP EQUIPMENT

Harold Keller, and Patrick J. Young, both of Lewiston, Idaho, assignors to Potlatch Forests, Inc., Lewiston, Idaho

Filed Apr. 9, 1969, Ser. No. 814,770

Int. Cl. B65g *47/22;* **B65h** *9/14*

U.S. Cl. 198—29 **4 Claims**



An indexing mechanism is disclosed for intermittently feeding crossband veneer sheets to a plywood layup station. The indexing mechanism includes a vacuum feeder for successively conveying crossband veneer sheets to a stop means. The stop means includes a cylinder horizontally mounted transverse to the direction of travel with a flange thereon normally extending into the path of the sheets. The cylinder is rotated by a intermittent drive to intermittently feed the crossband to the plywood layup station with considerable precision.

3,613,860

UNSCRAMBLING CONVEYOR FOR BAKED GOODS

Fred L. Waite, 66 Clinton Place, Massapequa, N.Y.

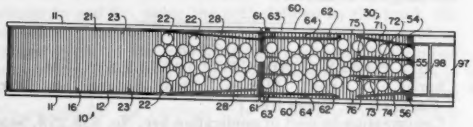
Filed July 9, 1970, Ser. No. 53,490

Int. Cl. B65g *47/26*

U.S. Cl. 198—30 **10 Claims**

A two section conveyor receives randomly disposed baked goods thereon and delivers them aligned in rows for the simultaneous removal of the first baked goods in the aligned rows, each row being disposed in a path between longitudinal guides. The first section of the conveyor has an upwardly

inclined endless belt of rotatably mounted transverse rollers to feed the baked goods thereon with small forward pressure between converging side guides to the second section of the conveyor. The second section of the conveyor has a transverse rotating paddle to knock backward the uppermost of any accidentally stacked baked goods, pivotally mounted



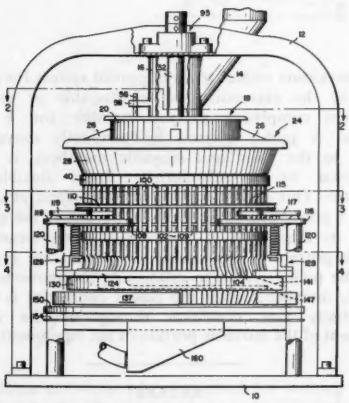
oscillating side guides disposed in front of the longitudinal guides forming rows, and vertically mounted driven drums in front of longitudinal guides between adjacent rows. The second section of the conveyor has an endless belt of individually and rotatably mounted short lengths of rollers, a short length of each roller being disposed below each path for an aligned row of baked goods.

3,613,861

CAPSULE ORIENTING MACHINE

Alten E. Whitecar, Westville, N.J., assignor to Smith Kline & French Laboratories, Philadelphia, Pa.

Filed May 15, 1970, Ser. No. 37,733
Int. Cl. B65g *47/24*
U.S. Cl. 198—33 **10 Claims**



A machine for orienting capsules of the conventional type comprised of a cylindrical interfitted cap and body in which the capsules are fed from a random supply through vertically extending tubes to a means for orienting the capsule in a desired position. The capsule orienting means includes means for forcing the capsule through a restricted passage so that the cap is held by a restriction while the body is turned to a desired oriented position after which the capsule is removed from the restricted passage and discharged.

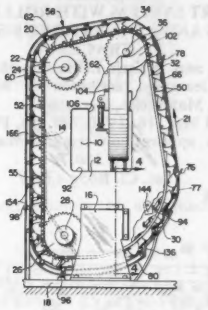
3,613,862

BOBBIN-HANDLING APPARATUS

William E. Stoppard, Warwick, R.I., assignor to Leesona Corporation, Warwick, R.I.

Filed Aug. 4, 1969, Ser. No. 847,240
Int. Cl. B65g *47/24*
U.S. Cl. 198—33 AA **5 Claims**

Apparatus for segregating a jumbled mass of bobbins and delivery of the bobbins one at a time in axial orientation. A chain conveyor includes a plurality of buckets for receiving bobbins. These buckets open inwardly and together form the bottom of a hopper which receives the jumbled bobbins. As the conveyor is driven, a bucket receives a bobbin from the hopper and carries the bobbin upwardly along a substantially straight path to a discharge chute at an upper portion of the apparatus. The buckets have a particular cross-sectional configuration so that when they are on the straight upwardly



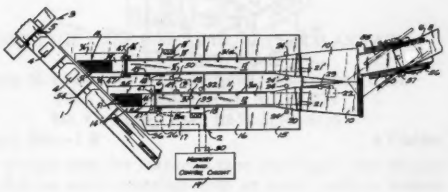
extending path they will retain only one bobbin having a rounded cross section and within a particular range of diameters varying from an empty bobbin core to a full bobbin. If a second bobbin is picked up by a bucket it will drop from the bucket along the straight path and fall back into the hopper. By varying the inclination of the buckets along the straight portion of the path, the range may be varied. A bobbin in the hopper may tend to align itself with its axis parallel to the direction of movement of the buckets and would thus block the buckets from receiving bobbins having their axes transverse to the path of movement of the buckets. Such a parallel bobbin flips into position with its axis transverse to the path of the buckets upon movement of an inclined edge of an adjacent bucket against the bobbin in a direction transverse to the general upward path of the buckets. Concurrently with such transverse movement of each bucket, a finger is moved across the inclined edge and transfers any strands of yarn extending across the edge into a cutter. Alternatively, each bucket may be provided with a cutter which is moved across the inclined edge, in lieu of the finger and common cutter. Bobbins are fed into the hopper responsive to a reduction in weight of the bobbins in the hopper and the hopper is driven intermittently to deliver bobbins one at a time responsive to an external demand.

3,613,863

INDUCTION SCHEME AND AUTOMATIC LOADER

Robert R. Hedrick, and Arthur L. Thomas, both of Milwaukee, Wis., assignors to Automatic Sprinkler Corporation of America, Cleveland, Ohio

Division of Ser. No. 686,385, Nov. 21, 1967, Pat. No. 3,491,903.
Filed Nov. 24, 1969, Ser. No. 879,025
Int. Cl. B65g *47/24, 47/26*
U.S. Cl. 198—33 **7 Claims**



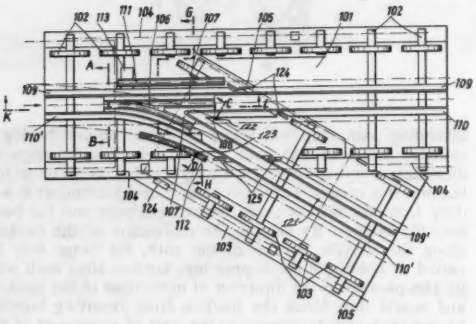
Induction or loading apparatus includes a pair of parallel induction lines mounted in side-by-side relation and extending at an angle from a main tilting tray sorter. The articles are fed from a single-input conveyor belt for both

lines to a swinging conveyor belt mounted above the top of loading chutes to the lines and selectively swung between the two chutes to continuously transfer articles into the pair of induction lines. The articles are moved through a separating and infeed conveyor belt which is operated in timed relationship to the sorter.

3,613,864
TRANSPORT SYSTEM WITH ROLLER TRACKS, CONTAINERS AND AT LEAST ONE SWITCH FOR THE TRACKS

Gerhard Lingg, and Welsch Leimen, both of Hans-Juergen, Mannheim, Germany, assignors to Mannesmann-Geisel GmbH & Co., Mannheim, Germany

Filed Mar. 16, 1970, Ser. No. 19,636
Claims priority, application Germany, Mar. 15, 1969, P 19 13 350.7
Int. Cl. B65g *43/00*
U.S. Cl. 198—38 **10 Claims**

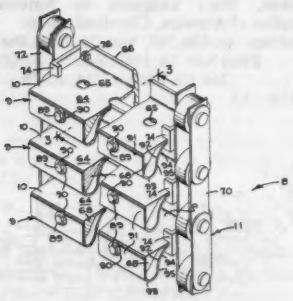


A switch in a roller track system with a single, low level switch blade controlling passage of a single guide pin in the bottom front of a container across the switch, and into the appropriate branch of the roller track; additional guide pins and guide rolls on the container run in appropriate tracks, to guide the container without bouncing.

3,613,865
CONVEYING SYSTEM

James L. Reimers, San Jose, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed Mar. 5, 1970, Ser. No. 16,890
Int. Cl. B65g *15/00*
U.S. Cl. 198—131 **10 Claims**

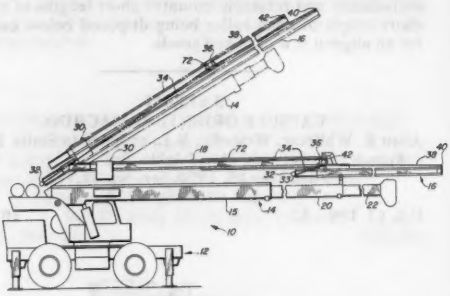


A conveying system for a hydrostatic cooker having carrier bars mounted on a processing conveyor of predetermined pitch, and having removable adapters for adapting carriers to controllably handle a wide range of container sizes, including easily deformable containers such as aluminum or plastic containers supported on their ends. The adapters are removably mounted on the carrier bars and have a curved camming surface adapted to cam containers that are supported on their ends into positions where they will not be pinched by the articulating carrier bars. The adapters may be of different sizes and/or may be mounted on only selected ones of the carrier bars so that a single-processing conveyor will be capable of simultaneously handling more than one size range of containers.

3,613,866
POWER CONDUCTOR TAKEUP SYSTEM

Charles J. Arndt, Marion, Ohio, assignor to Harsco Corporation, Camp Hill, Pa.

Continuation-in-part of application Ser. No. 858,298, Sept. 16, 1969, now abandoned. This application Mar. 30, 1970, Ser. No. 23,706
Int. Cl. B65g *15/26*
U.S. Cl. 198—139 **10 Claims**

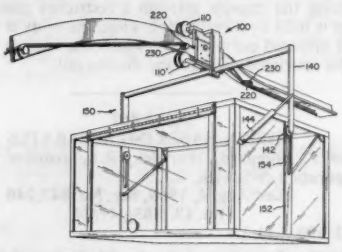


This invention relates to an improved system for providing power to the extremities of telescopable or expandable equipment comprising a fixed member and a movable member. A pulley system, independently movable with respect to the fixed and movable members, is rotatably transversed by a substantially lineal flexible power conductor. This power conductor is attached at one of its ends to a power source on the fixed portion of the equipment and at its other end to a power utilizing means on the movable portion of the equipment. Means are provided to move the pulley system in relation to the movement of the movable member so that the power conductor is held in a substantially taut condition throughout the range of movement of the movable portion of the equipment.

3,613,867
CONVEYOR HAVING TWISTED TRACK SECTIONS

Richard A. Kroeger, 311 Oak Park Circle, Tullahoma, Tenn., and Juel G. Sweattie, 1003 Elmwood, Norman, Okla.

Filed Sept. 14, 1970, Ser. No. 72,048
Int. Cl. B65g *17/20*
U.S. Cl. 198—177 **12 Claims**



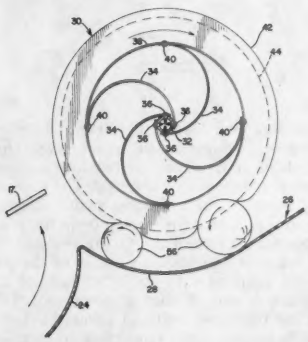
Method and apparatus for the balanced conveyance of liquid and related containers. The present system comprises a

substantially rigid, universally directional and graded track upon which is mounted a plural carriage system having track-engaging and material-carrying complements, one of which is adapted to horizontal and vertical positioning relative to the ground and the other of which, by virtue of a substantially universal mounting on the former, is adapted to level flight from the point of embarkation to deposit and return. There are novel means for impelling the combined carriage elements to and fro, along the path defined by the track, the track having unique bends and twists to insure level or balanced flight of the carriages and contents. One unique feature of the invention in a preferred modification resides in the definition of track bends and twists, such that the driving cable pulleys for the carriage may be disposed orthoganally relative to the track flange portion of the fixed track conveyor. In this way, the track of rigid construction may contain a drive system whose traverse may pass through numerous distinctive different planes of motion defined by said track. In effect, the plane of rotation of pulleys used in supporting the motive means, retains a constant relationship to the cross section of the track, irrespective of its disposition relative to the starting and terminal points thereof.

3,613,868
CONVEYOR WHEEL

Calvin P. Rickerd, La Grange Park, and Tommy A. Middlesworth, Hinsdale, both of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Aug. 5, 1970, Ser. No. 61,296
Int. Cl. B65g *29/00*
U.S. Cl. 198—211 **7 Claims**



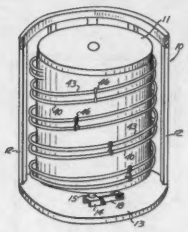
A rotatable conveyor wheel adapted for moving articles such as fruit or the like. The conveyor wheel includes a hub rotatable about a fixed axis disposed above a surface along which the articles are to be moved. The outer periphery of the wheel is defined by annular resilient cushions which are yieldably engageable with the articles to move the same along the surface. The annular cushions are mounted on a rim which is connected about the hub by a plurality of resilient spokes. By this arrangement, the rim and cushions may move relative to the fixed axis of rotation to accommodate articles of a variety of sizes or variable volumes of articles.

3,613,869
MECHANISM FOR CYCLICALLY MOVING A PARTS ACCUMULATOR-CONVEYOR

Henry A. Schuricht, Pontiac, Mich., assignor to Hydromation Engineering Company, Livonia, Mich.

Division of Ser. No. 696,392, Feb. 4, 1969, abandoned. Filed Sept. 15, 1970, Ser. No. 72,320
Int. Cl. B65g *27/02*
U.S. Cl. 198—220 **10 Claims**

A mechanism for cyclically raising, oscillating and lowering a vertically arranged drumlike parts conveyor of the type having a spiral wound shuttle track for moving parts incrementally along an adjacent fixed spiral wound track

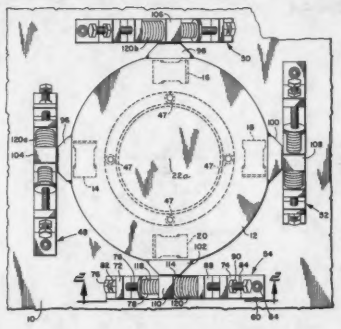


upon which a large number of workpieces or parts are supported.

3,613,870
DRIVE AND SUPPORT SYSTEM FOR VIBRATORY PARTS FEEDER

Warren C. Burgess, Jr., Avon Lake, Ohio, assignor to Burgess & Associates, Inc., Lakewood, Ohio

Filed Oct. 21, 1969, Ser. No. 868,128
Int. Cl. B65g *27/02, 27/32*
U.S. Cl. 198—220 BC **10 Claims**



There is provided an improved spring system for a vibratory parts feeder bowl which is characterized by two separate spring systems, one of which functions primarily to guide the bowl along a predetermined, inclined, arcuate path (which may be a closed loop), and the other of which functions to store and release energy imparted to the bowl by a vibration inducing device at an energy level greater than can be sustained by a conventional spring system.

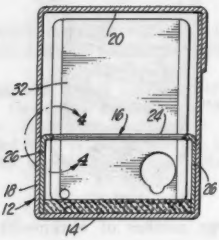
3,613,871
STORAGE CASE FOR ARTICLES SUCH AS TAPE CARTRIDGES

Thomas H. Evans, 265 Briarcroft Road, Claremont, Calif.

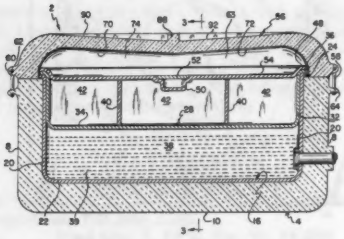
Filed June 19, 1970, Ser. No. 47,729
Int. Cl. A45c *11/00*; B65d *5/50, 85/67*
U.S. Cl. 206—1 R **6 Claims**

A storage case for magnetic tape cartridges. The storage case has an outer container with an inner resilient bottom pad and an inner cartridge holder fashioned from sheet stock which is folded to provide a platform having depending flanges along its edges for supporting the platform in spaced parallel relation above the pad. The holder platform is slotted to snugly receive the tape cartridges in spaced side-by-side relation with the transcribing ends of the cartridges, i.e., the

cartridge ends along which extend the exposed runs of cartridge tape, resting on the resilient pad to prevent entrance of dust into the cartridges and shield the exposed tape runs against overheating.



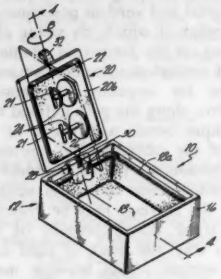
3,613,872
RECEPTACLE DEVICE FOR FOOD AND BEVERAGE PRODUCTS OR THE LIKE
James G. Donnelly, 5314 McBride Ave., Cleveland, Ohio
Filed Apr. 10, 1969, Ser. No. 814,994
Int. Cl. B65d *25/00*; **A45c** *11/20*
U.S. Cl. 206—4 **8 Claims**



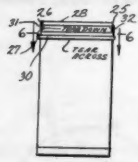
A lunchbox including a heat-insulating housing and a first container within the housing and in close-fitting engagement therewith. A second container adapted to contain food is suspended in the first container with its bottom spaced above the bottom of the first container to provide space for storing liquid. A faucet outside the first container communicates with the liquid compartment. The second container has a close-fitting cover and the housing has a removable cover. The housing cover has its bottom surface spaced from the second container cover to provide an additional compartment for food or utensils.

3,613,873
JEWELRY BOX
Harold Schulman, 15 Franklin Road, Scarsdale, N.Y.
Filed Feb. 4, 1970, Ser. No. 8,482
Int. Cl. B65d *43/16*
U.S. Cl. 206—45.15 **3 Claims**

A jewelry box suitable for use as a display stand in the retail sale of jewelry products includes a cover having a protective exterior face and a decorative interior face. The cover is secured to the box by a pin and socket joint which permits the cover to overlie the box with its exterior face exposed outwardly for shipment and storage and to rotate into a display position with its interior face exposed outwardly to provide a display surface for jewelry.

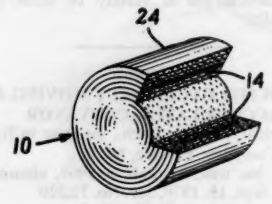


3,613,874
RECLOSABLE PACKAGE
Harmon B. Miller, Atlanta, Ga., assignor to Reclosable Package Corp., Atlanta, Ga.
Filed Aug. 21, 1969, Ser. No. 851,978
Int. Cl. B65d *33/18, 77/12, 85/00*
U.S. Cl. 206—46 F **21 Claims**



A tape comprising two layers of flexible sheet material bonded together by pressure-sensitive adhesive. The outer surfaces of the sheet material are coated with a permanent-type adhesive such as a heat seal material. The tape is sealed between facing members of a flexible pouch adjacent one edge. A tear strip is provided for tearing open the pouch and removing the portion of one of the facing members bonded to one side of the tape. At least a portion of the pressure-sensitive adhesive remains with the other side of the tape bonded to the other facing member of the closure. This other facing member can be folded over and adhered to the outside of the package by means of the remaining pressure-sensitive adhesive.

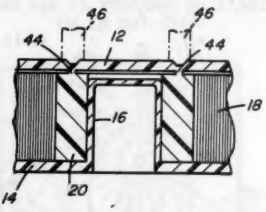
3,613,875
COMPRESSED FABRIC MATERIAL WITH CARRYING BAG
August L. Franke, 915 W. Front Road, Plainfield, N.J.
Filed Apr. 7, 1970, Ser. No. 26,211
Int. Cl. B65d *85/08*
U.S. Cl. 206—47 R **7 Claims**



A compressed piece of fabric with a plastic carrying bag included therein is disclosed. The piece of fabric when

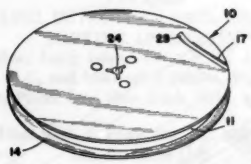
wetted releases the plastic carrying bag which may then be used for storage of the wetted fabric until it is next desired to use the same.

3,613,876
ANTICLOCKSPRING DEVICE AND METHOD
John C. Kohler; Robert C. Sutliff, and Corrado Zollo, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Nov. 24, 1969, Ser. No. 879,161
Int. Cl. B29c *27/08*; B65d *85/67*; B65h *75/18*
U.S. Cl. 206—52 F 7 Claims



In a film cartridge having a core support hub extending through the film core, preventing clock-springing of a roll of film therein providing one or more spotwelds between the surface of the core and the end of the hub which has sufficient strength to prevent the core from rotating during shipping but which will break as the film is withdrawn from the cartridge, permitting the core to rotate. The spotwelds may be formed ultrasonically or by a solvent or adhesive. An alternate embodiment utilizes a paper paster which is glued across the core and the hub and which is torn by the withdrawal of film from the cartridge permitting the core to rotate.

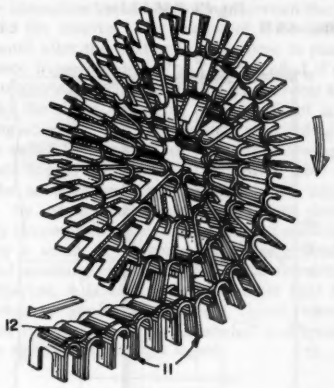
3,613,877
REEL AND LOCKING MEANS FOR THE OUTER END OF THE STRIP
Ronald Jon Sorensen, Northlake, Ill., assignor to Ampex Corporation, Redwood City, Calif.
Filed June 4, 1969, Ser. No. 830,242
Int. Cl. B65d *85/67*
U.S. Cl. 206—53 11 Claims



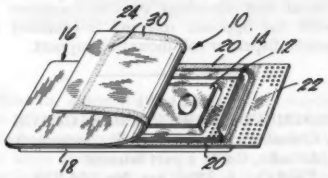
A reel for winding strip material such as magnetic tape or the like is provided with a locking means integral with the outer surface of the reel flange to hold the outer end of the wound strip in place during storage and handling. In one embodiment, the locking means also serves as a splicing jig for joining two strips.

3,613,878
U-CLIP ASSEMBLY
Arthur Langas, and Harrison C. Lingle, both of Wilmette, Ill., assignors to Hartco Company, Wilmette, Ill.
Filed Aug. 29, 1969, Ser. No. 854,037
Int. Cl. B65d *73/02*
U.S. Cl. 206—56 AC 5 Claims

A spring retainer clip assembly in the form of a row of U-shaped sheet metal clips having arched crown portions and planar side legs, adjacent clips having their side legs in substantial face-to-face contiguity, and all of the clips being mounted on the underneath side of a flexible carrier strip which bridges the crown portions and is adhesively secured to the crown portions coextensively along the row.

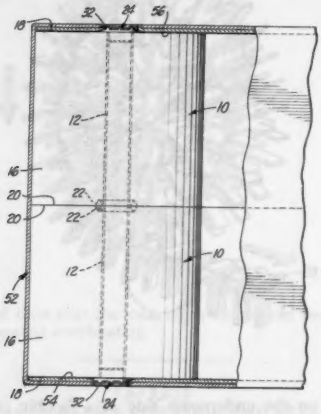


3,613,879
SUTURE PACKAGING
Mern S. Kemble, Deerfield, Ohio, assignor to Philip Morris Incorporated, New York, N.Y.
Filed Aug. 19, 1969, Ser. No. 851,166
Int. Cl. A61i *17/02*
U.S. Cl. 206—63.3 1 Claim



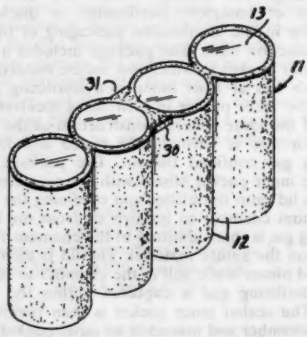
A package for sutures which are contained under conditions of complete sterilization is disclosed with a method for in-line sterilization packaging of the objects on mass production basis. The package includes a hermetically sealed inner packet in which the suture material is received and which has at least initially, a sterilizing gas confined therein, the inner packet in turn being received in an outer packet of the same general construction as the inner packet and which also is hermetically sealed and initially has a sterilizing gas confined therein. The package is made by filling the inner packet blister with the suture material, then tacking a lid onto the blister and confining the inner packet in a vacuum chamber to remove air from the inner packet. Sterilizing gas is then admitted to the chamber for killing any bacteria on the suture material. The lid is then sealed to an associated blister while still in the chamber so that a quantity of the sterilizing gas is captured within the sealed inner packet. The sealed inner packet is then removed from the vacuum chamber and placed in an outer packet blister and a closure lid tacked in place on the blister. The outer packet is then subjected to the same sterilization and packaging procedures as the inner packet.

3,613,880
STRIP MATERIAL ROLL HAVING IMPROVED TRUNNION AND METHODS OF SHIPPING AND DISPENSER MOUNTING THE SAME
Jack L. Perrin, Los Angeles, Calif., assignor to Towlsaver, Inc., Los Angeles, Calif.
Filed Sept. 29, 1969, Ser. No. 861,626
Int. Cl. B65d *85/67*
U.S. Cl. 206—65 R 15 Claims



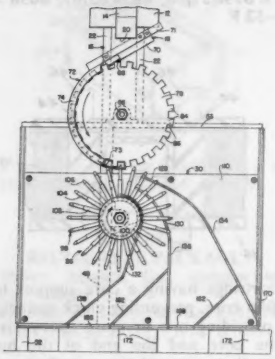
Strip material rolls have a trunnion mounted at one of the core portion ends thereof and the rolls are received in a carton for shipping with two of the rolls stacked axially aligned one above the other, the respective trunnion ends thereof oppositely facing carton walls. As carton positioned, flat end surfaces of the two rolls opposite from the trunnion ends thereof flatwise abut and the roll trunnion ends outwardly of the trunnions flatwise abut the carton walls while spaced axial projections of each of the trunnions penetrate the respective carton walls retaining the rolls against shifting within the carton and prevential axial telescopic disorientation of the strip material on the rolls. After shipping, a roll is removed from the carton and the trunnion end rotatably locked with a dispenser rotatable support member by axially inserting the trunnion projections into matching radial slot openings of the dispenser support member, while the opposite roll end is rotatably engaged with an opposite dispenser roll-mounting support.

3,613,881
COMBINED CARRIER AND PACKAGE
Kenneth F. Oldenburg, Arcadia, Calif., assignor to Fred N. Schwend, Arcadia, Calif., a part interest
Filed Oct. 6, 1969, Ser. No. 864,035
Int. Cl. B65d *79/00, 21/02*
U.S. Cl. 206—65 C 1 Claim



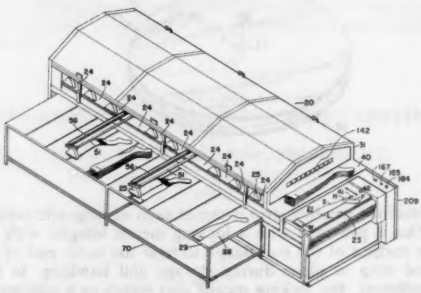
A combined carrier and thermally insulated package for a plurality of liquid containers, formed of molded plastic foam surrounding the containers and adapted to be readily separated to form individual thermally insulated containers.

3,613,882
NUT-SORTING MACHINE
Henry M. Stampe, 9091 Gale, Pontiac, Mich.
Filed Mar. 19, 1970, Ser. No. 21,059
Int. Cl. B07c *5/06*
U.S. Cl. 209—73 15 Claims



This invention relates to an improved nut fastener sorting machine having a feed wheel for supplying the fasteners to a complementary spoke wheel having plug gage-type spoke members upon which the nuts are dropped one at a time from the feed wheel and from which they are removed by a split member stripper and discharged selectively into containers according to their respective positions upon the spoke members.

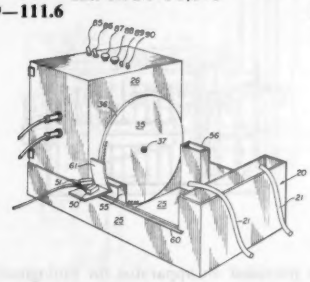
3,613,883
APPARATUS AND METHOD FOR TRANSFERRING FLACCID ARTICLES
Leslie Starbuck, Gedling, England, assignor to Speizman Industries, Inc., Charlotte, N.C.
Filed Aug. 19, 1969, Ser. No. 851,313
Int. Cl. B07c *3/06*
U.S. Cl. 209—74 32 Claims



A machine for sorting stockings according to length by the use of movable suction nozzles that selectively remove stockings from a conveyor belt and transport them to transferred locations in response to sensing of the lengths of the stockings. The suction nozzles are equally spaced adjacent an edge of the conveyor belt for engagement of the welt end portions of stockings that are supported transversely on the belt at spacings equivalent to the spacing of the nozzles, which move transversely of the belt to transport stockings with the engaged welt end portions leading to transferred locations. Length sensing components are disposed adjacent each nozzle location to sense the presence

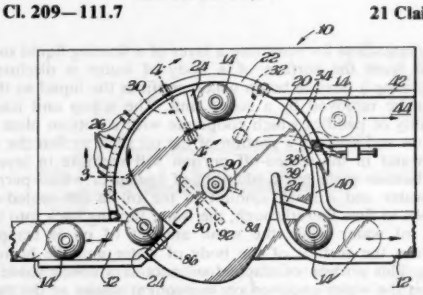
thereat of stockings of a particular length as the stockings are sequentially advanced by the conveyor belt, with the sensing components at different nozzle locations sensing the presence of stockings of different lengths. The suction nozzles are responsive to the adjacent sensing components for transfer by each nozzle of stockings that are sensed to be of the particular length that is to be transferred by that nozzle, with each nozzle being inoperable when no stocking or a stocking of a different length is at the nozzle location.

3,613,884
FISH EGG SORTING APPARATUS
Neil Van Gaalen, P.O. Box 578, Glenwood Springs, Colo.
Filed Apr. 13, 1970, Ser. No. 27,862
Int. Cl. B07c *5/342*
U.S. Cl. 209—111.6 **14 Claims**



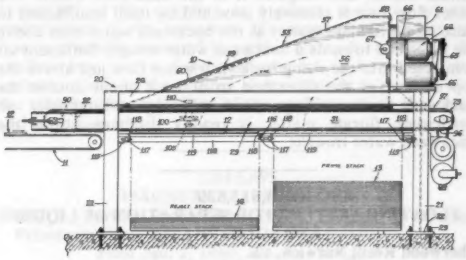
Fish egg sorting apparatus comprising a rotated disc provided with a series of holes extending through the disc adjacent its peripheral surface, each hole capable of containing two fish eggs, photoelectrical means for scanning two eggs at the same time, one of the two eggs being carried in the front end of a hole and the other of the two eggs being carried in the rear end of another hole, and means activated when a dead egg is scanned for ejecting the dead egg from its hole. A glass shield is located closely adjacent the periphery of the disc, between the rotating disc and scanning means, for preventing water from spattering on the scanning means and for holding a water bead between the disc and scanning means providing a clear path through which a light beam from the electrical means passes to eggs in the disc, said water bead preventing formation of film on either the shield or disc which might interfere with passage of the light beam.

3,613,885
BOTTLE LABEL DETECTOR-LABEL INSPECTING AND SORTING APPARATUS
Denis O. Rehse, Long Island City, N.Y.; Alfred P. Brooks, Cranbury, N.J., and Michael J. Bilello, Staten Island, N.Y., assignors to Pfizer Inc., New York, N.Y., by said Rehse and Brooks
Filed Sept. 3, 1969, Ser. No. 854,877
Int. Cl. B07c *5/34*
U.S. Cl. 209—111.7 **21 Claims**



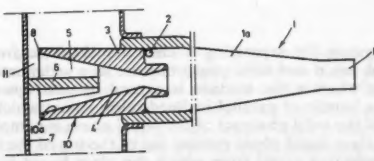
A starwheel turntable abstracts articles from a conveyor and returns properly labeled objects to it. Inadequately labeled objects are diverted and segregated. Labels are sensed in an initial portion of the turntable and accept signals generated thereby are advanced to the diverter when the articles pass through an advance triggering device. A verifying reject signal for the following article is generated when the immediate article is passing between the triggering device and the diverter. The release of this reject signal is delayed until after the next article has time to pass through the advance triggering device and is cancelled if such next advance triggering is accomplished. This prevents any article slipping by the signal advancing trigger without actuating it from being accepted. The reject signal is accordingly held in a bistable switch long enough to reject the following article if it does not trigger the advance of its own label detecting signal. The advance and verifying signals are conveniently triggered by photoelectric devices. Label detecting is effectively accomplished for transparent and semitransparent articles by a series of photoelectric sensing heads having illuminated scanning chambers past which the articles pass closely adjacent. A label disperses sufficient light back into the chamber to generate an accept signal, whereas, the transparent or semitransparent unlabeled wall transmits the light away without generating a signal.

3,613,886
FEEDER AND STACKER
Loren B. Barker, Salem, Ill., assignor to Lear Siegler, Inc., Salem, Ill.
Filed Nov. 22, 1968, Ser. No. 778,252
Int. Cl. B07c *3/06*
U.S. Cl. 209—125 **9 Claims**



A machine for automatically feeding and coupling individual sheets of material to an adjacent run of an overdisposed high-speed belt conveyor by which the sheets are transferred to one or more remote locations and from which the same are selectively released, discharged and stacked in preselected groups; the feeding, coupling and the selective discharge functions being automatically carried out by selective control of the ambient atmosphere about the conveyor and sheet materials.

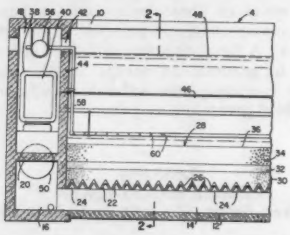
3,613,887
CLYCLONE SEPARATOR TO BE BUILT IN A CASING OR SIMILAR
Nils Anders Lennart Wikdahl, 42, Bravallavagen, Djursholm, Sweden
Filed Oct. 14, 1968, Ser. No. 767,151
Int. Cl. B04c *5/13*
U.S. Cl. 209—211 **5 Claims**



A cyclone separator has in its outlet for the light fraction a vortex finder, the outwardly facing part of which is divided

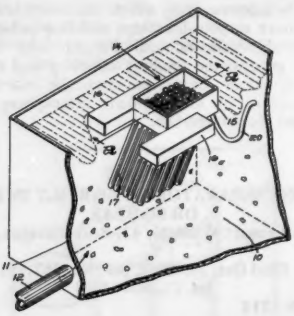
by a plurality of radially disposed partition walls joined by an elongate nave extending coaxially with the separation chamber of the separator. The nave protrudes outwardly from the outlet to constitute a distance member for a wall of a casing for the separator and also to define in conjunction with the casing wall and the end of the outlet an annular slot for radially deflecting the partial flows of the light fraction passing between the partition walls.

3,613,888
FILTER-BACKWASHING METHOD
W. Leslie Harris, Concord, Calif., assignor to Contra Costa County Water District, Concord, Calif.
Filed Apr. 13, 1970, Ser. No. 27,625
Int. Cl. B01d *23/24*
U.S. Cl. 210—80 **6 Claims**



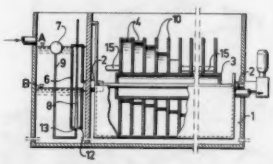
A waterplant granular filter bed is backwashed by flowing backwash water through the bed to dislodge particulate filtrate matter and suspend it in the backwash water. The water flow rate is relatively slow and by itself insufficient to raise all particulate matter as the backwash water rises above the filter bed towards a backwash water trough. Sufficient air is injected into the rising backwash water flow just above the top surface of the filter bed to at least about double the backwash water rising speed whereby substantially all particulate filtrate matter is readily discharged into the backwash water troughs.

3,613,889
FLOATING SETTLER FOR SEPARATION OF LIQUID AND SOLID PHASES
Sherwood Reed, Norwich, Vt.
Filed June 16, 1970, Ser. No. 46,712
Int. Cl. B01d *21/00*
U.S. Cl. 210—84 **3 Claims**



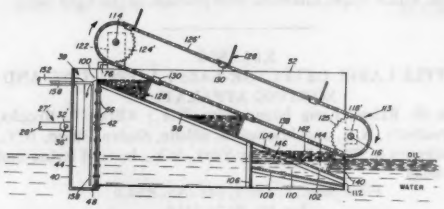
In a system for separating a clear liquid phase from a combined liquid and solid phase mixture in a sedimentation container wherein the mixture is caused to pass upwardly through a bundle of parallel inclined tubes within which the settling of the solid phaseout of the liquid phase is completed with the clear liquid phase passing out of the top of the tubes into a collecting vessel from which the clear liquid is then drained, the improvement comprising floating said bundle of inclined tubes within the liquid mixture so that the clear liquid phase may be removed from the system at a steady uniform rate despite changes in the liquid level in the sedimentation container.

3,613,890
APPARATUS FOR BIOLOGICALLY PURIFYING SEWAGE
Ake Oscar Wilhelm Hellqvist, Djurhamn, Sweden, assignor to AB Gustavsbergs Fabriker, Gustavsberg, Sweden
Filed Sept. 10, 1969, Ser. No. 856,559
Claims priority, application Sweden, Sept. 11, 1968, 12191/68
Int. Cl. B01d *21/00*
U.S. Cl. 210—150 **3 Claims**



There is provided an apparatus for biologically purifying sewage from which the sludge has been removed. The apparatus causes a reduction of nitrogen in the sewage with the aid of aerobic micro-organisms and includes a trough with an inlet and an outlet and in which is arranged a rotor with a plurality of plates with vanes arranged between the plates which vanes are angularly displaced in relation to each other.

3,613,891
OIL REMOVAL APPARATUS
Charles C. Cloutier, Morgan City, La., assignor to Anti-Pollution Inc., Morgan City, La.
Filed Mar. 24, 1970, Ser. No. 22,170
Int. Cl. B01d *17/02*
U.S. Cl. 210—242 **36 Claims**



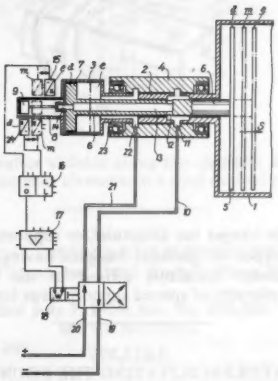
An apparatus for removing a layer of a floating liquid such as oil from the surface of a body of water is disclosed, comprising a flexible boom which confines the liquid so that it can be removed by a scoop unit. The scoop unit has a plurality of paddles which cooperate with a bottom plate to enclose and seal off a portion of the oil slick so that the oil and water in the sealed-off portion will separate in layers. The bottom plate has a plurality of apertures which permit the water and a small amount of the oil in the sealed-off portion to flow therethrough, the water flowing back into the body of water while the small amount of oil is trapped between the surface of the body of water and the bottom plate. This portion of trapped oil acts as a check valve to permit the water enclosed on subsequent passes of the paddles to pass through the holes in the bottom plate and to prevent the oil picked up on these subsequent passes from flowing through the apertures. After separation of the oil and water, the oil is carried by the paddles to a sump, for removal to a storage area.

3,613,892

STROKE CONTROL FOR THE PUSH BOTTOM OF A PUSH CENTRIFUGE

Fritz Ziller, Essen, Germany, assignor to Alfa-Laval Bergedorfer Eisenwake G.m.b.H, Hamburg-Bergedorf, Germany

Filed Dec. 13, 1968, Ser. No. 783,631
Claims priority, application Germany, Dec. 14, 1967, P 16 32 272.8
Int. Cl. F011 *25/08*; B04b *3/02*
U.S. Cl. 210—374 4 Claims



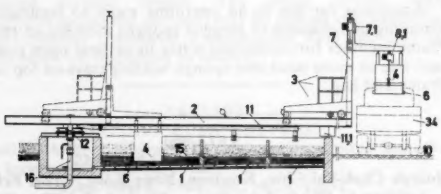
A stroke control device for the push bottom of a push centrifuge having a pressure fluid drive for reciprocating said push bottom, and valve means adapted to reverse the flow of pressure fluid, said stroke control device comprising an electric impulse transmitter mounted for reciprocating movement with said push bottom and adapted for contact-free impulse transfer, two impulse-receiving initiators located along the path of said transmitter and adapted to initiate electric control pulses in response to the approach of said transmitter, and valve control means operating said valve means in response to said control pulses.

3,613,893

TREATING INSTALLATION FOR SLUDGE

August Schreiber, Bahnhofstr. 45, 3001 Hannover-Vinnhorst, Germany

Filed Apr. 8, 1970, Ser. No. 26,534
Claims priority, application Germany, Apr. 9, 1969, Apr. 9, 1969, P 19 18 077.9;P 19 18 078.0
Int. Cl. C02c *3/00*
U.S. Cl. 210—272 12 Claims



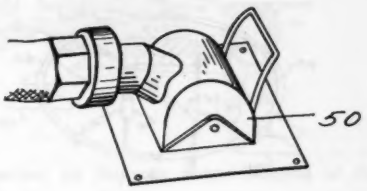
The invention relates to an installation for the drying and composting of watery sludge of the type which is prepared from sewage and comprises drying and composting beds over which a removable bridge is rotatably mounted with a conveying bucket movably mounted on the bridge and having filling discharging devices to remove and load layers of the sludge on the composting beds.

3,613,894

SUBMERGED SUCTION STRAINER FOR A WATER HOSE

Kenneth K. Clegg, Jr., Rte.1, Box 80, High Point, N.C.

Filed Jan. 13, 1970, Ser. No. 2,634
Int. Cl. B01d *21/24*
U.S. Cl. 210—456 4 Claims



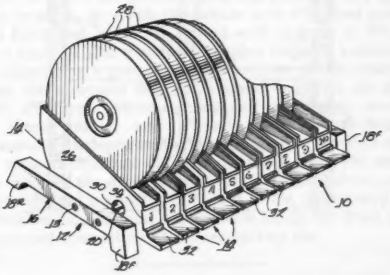
A suction strainer, preferably for use in a dump and go tank such as used in firefighting, which, during liquid withdrawal, rests continually on the bottom of the tank so as to eliminate whirlpool and suction loss and which, when in place, has its intake immediately adjacent the bottom of the tank so that water can be withdrawn to a very low level in the tank. In one embodiment, a unitary coupling member rests in a shallow tray on the bottom of the tank and liquid in the tank is pulled past the tray, into the member via a mesh screen which removes foreign objects, and out the coupling member to a conventional firefighting hose which is connected to the coupling at a preset angle. In another embodiment of the invention, the member coupled to the hose is pivotably mounted to a guide plate which rests on the shallow tray and is fixed with respect to it, so that any antiswirl plates in the strainer always remain in parallel with the tank bottom regardless of the angle at which the dump and go tank is set.

3,613,895

MAGNETIC TAPE HOLDER

Mark E. Larkin, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed Jan. 2, 1969, Ser. No. 788,535
Int. Cl. A47g *29/00*
U.S. Cl. 211—40 6 Claims



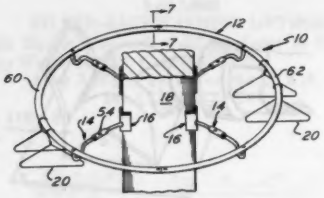
Elongate cradle members having arcuate support surfaces are formed so as to supportingly receive an outer peripheral portion of a magnetic tape container or the like. The cradles are pivotally mounted in axial alignment on a first transverse frame member traversing each cradle. Each cradle member may be pivotally moved out of axial alignment with the remaining cradles whereby the container supported thereby may be readily grasped and removed.

3,613,896

CLOTHING RACK

Anthony Stanley Miller, Jr., Happy Acres, R.D. 2, Atsion-Medford Road, Vincentown, N.J.

Filed May 25, 1970, Ser. No. 40,025
Int. Cl. A47f 5/08
U.S. Cl. 211—107 12 Claims



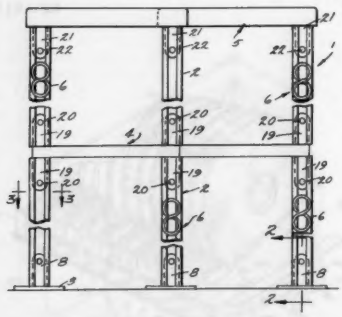
A clothing rack adapted to be mounted on a supporting column in a clothing store. The rack comprises a continuous loop that surrounds the column, and a plurality of bars which connect the loop to the column. Each of the bars includes a mounting plate which abuts the column and an adjustment mechanism for increasing the effective length of the bar, whereby the bar is tightly held between the loop and the mounting plate, thus forcing the mounting plate against the column. This force will in turn maintain the horizontal and vertical orientation of the loop relative to the column.

3,613,897

SPRING CLIP RACK

Isadore J. Filler, Atlanta, Ga., assignor to I. J. Filler Enterprises, Inc., Atlanta, Ga.

Filed Jan. 5, 1970, Ser. No. 775
Int. Cl. A44b 21/00; A47f 7/00
U.S. Cl. 211—120 11 Claims



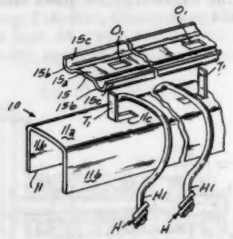
A display rack for supporting packaged articles that is constructed from easily assembled components. A plurality of article clamps mounted on the rack which hold the packaged articles in two ways; (1) by resiliently clamping a portion of the package between two adjacent coils of a spring and (2) by impaling the clamped portion on a pointed member.

3,613,898

CAP LOCKING MEANS FOR WARDROBE HANGER BAR

Francis P. Brennan, 1057 Rolling Drive, Lisle, Ill.

Filed Jan. 14, 1970, Ser. No. 2,888
Int. Cl. B65d 85/18
U.S. Cl. 211—124 10 Claims



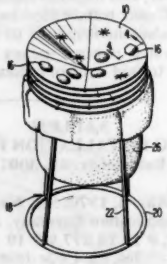
A portable hanger bar structure for supporting a plurality of various types of garment hangers having an overlying locking member releasably affixed to the bar structure providing a plurality of spaced support areas for the hangers.

3,613,899

APPARATUS FACILITATING THE COUNTING AND DISPOSAL OF SURGICAL SPONGES

Thomas R. Schleicher, 1 Olde Coach Road, Glenmount, N.Y., and Robert D. Auten, Rte. #5, Juniper Drive, Ballston Spa, N.Y.

Filed July 2, 1970, Ser. No. 51,806
Int. Cl. A47f 3/14
U.S. Cl. 211—133 1 Claim



Apparatus for use in an operating room to facilitate the counting and disposal of surgical sponges includes an upright frame member for supporting a bag in vertical open position and one or more stackable sponge-holding trays on top of the frame and bag.

3,613,900

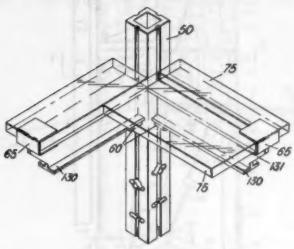
CONSTRUCTIONAL SYSTEMS

Joseph Chak-Fai Chiu, Kowloon, Hong Kong, Great Britain, assignor to Chiu's Joint System Limited, Tai Wai, Shatin, New Territories, Hong Kong, Great Britain

Filed June 24, 1969, Ser. No. 835,990
Claims priority, application Great Britain, July 2, 1968, 31,605/68
Int. Cl. A47b 9/08; A47f 5/00
U.S. Cl. 211—148 5 Claims

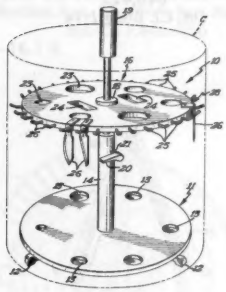
A readily assembled and demounted shelving system having a hollow post with channelled faces, and projection-

receiving slots interrupting the channels, there being an arrowheaded connecting member which is insertable into the



slots and thereafter slidable along the channels and which is supported by fastener elements in a final desired position.

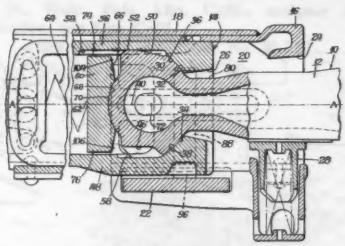
3,613,901
SURGICAL INSTRUMENT SUPPORT DEVICE
George Alfred Montelius, 2405 Euclid Place, Minneapolis, Minn.
Filed July 7, 1969, Ser. No. 839,566
Int. Cl. A47f 5/02
U.S. Cl. 211—166 3 Claims



A device for supporting surgical instruments comprises a base and a support member which are releasably interconnected by telescopic posts. The support member is provided with a plurality of supporting pins which support apertured surgical blades. The entire device, with instruments supported thereon, may be placed in a sterilizing jar or container containing a sterilization fluid and may be readily removed therefrom as desired.

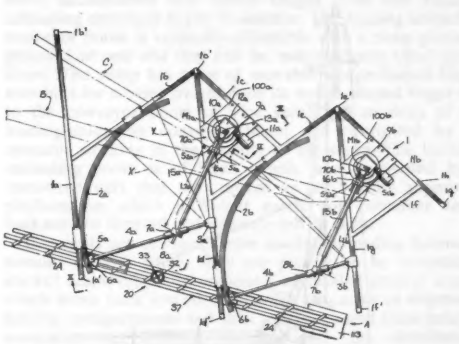
3,613,902
ROTARY DUMP COUPLER
Russell G. Altherr, Chicago, Ill., assignor to Amsted Industries Incorporated, Chicago, Ill.
Filed Nov. 6, 1969, Ser. No. 874,492
Int. Cl. B61g 9/04
U.S. Cl. 213—72 11 Claims

In a rotary coupler assembly, the butt of a coupler is retained within a pocket in a yoke by spaced keys. Spherical surfaces on the butt engage corresponding surfaces on the yoke and keys during rotation of the coupler. A follower plate contacting a draft gear is rotatably engaged with the rear of the butt through mating concave-convex surfaces. Stops on the yoke straps limit forward movement of the follower. Force exerted through the follower in combination with a top spherical surface on the butt that engages a



cylindrical surface on the yoke resists drooping of the coupler head.

3,613,903
TRANSFER APPARATUS
Jean Leblond, and Jean Biet, both of Compiegne, France, assignors to Uniroyal Englebert France S.A., Paris, France
Filed Jan. 28, 1969, Ser. No. 794,706
Claims priority, application France, Apr. 16, 1968, 148,266
Int. Cl. B65g 47/34
U.S. Cl. 214—1 BH 13 Claims

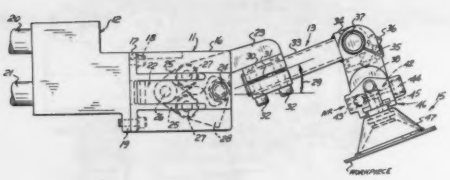


A transfer apparatus for transferring an article from a first location, in which the article is in a first position, to a spaced second location, in which the article is in a second position spaced from and angularly shifted with respect to the first position thereof. The transfer apparatus includes a stationary frame supporting a pair of parallel arcuate guides extending between the aforesaid first and second locations, an article support structure extending between and being movable along these guides, and a pair of drive mechanisms simultaneously independently moving spaced portions of the article support structure different distances along the arcuate guides. Each of the drive mechanisms includes a drive crank, a connecting rod pivotally connected to the drive crank, and a mechanism for changing the location along the drive crank of the pivotal connection of the connecting rod.

3,613,904
VACUUM HOLDER AND CONTROL ASSEMBLY
Leland F. Blatt, 24121 Mound Road, Warren, Mich.
Filed Sept. 12, 1969, Ser. No. 857,412
Int. Cl. B65g 47/91
U.S. Cl. 214—1 BV 3 Claims

A work-engaging vacuum gripper including vacuum means for creating a vacuum within a vacuum cup and adapter assembly adjustably mounted upon a power-pivoted boom assembly projecting from a combination jaw body and actuating unit whereby longitudinally reciprocal power

means from said actuating unit acting through said jaw body effects corresponding pivotal movements of the jaw arm and

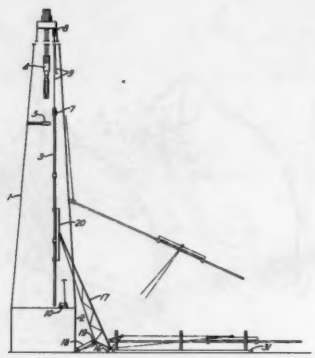


attached boom assembly which adjustably mounts the vacuum-operated workpiece-engaging gripper.

3,613,905
METHOD AND APPARATUS FOR HANDLING DRILL PIPE

Homer J. Woolslayer, Tulsa; Joseph R. Woolslayer, Tulsa; Cecil Jenkins, Tulsa, and Erwin A. Campbell, Bixby, all of Okla., assignors to Lee C. Moore Corporation, Tulsa, Okla.

Filed Apr. 6, 1970, Ser. No. 25,644
Int. Cl. E21b *19/00*
U.S. Cl. 214—2.5 **10 Claims**



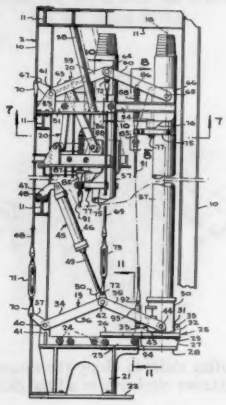
Pivotally supported beside an oil well is the inner end of a boom that can be swung in a vertical plane toward and away from the well. Clamping means for gripping a group of drill pipes are pivotally connected to the outer end of the boom on a horizontal axis in such a position that pipes gripped by the clamping means can swing across the boom as the outer end of the boom is raised or lowered, whereby the clamping means can extend downwardly when the boom is in its lower position and laterally toward the well when the boom is in its upper position.

3,613,906
DRILL STEM STORAGE AND HANDLING MECHANISM

Bruce Deyo, 686 Brightwood Drive, and Frank J. Klaus, 1244 Woodside Drive, both of Marion, Ohio

Filed May 20, 1970, Ser. No. 38,945
Int. Cl. E21b *19/14*
U.S. Cl. 214—2.5 **12 Claims**

Drill stem storage and handling rack for rotary blasthole drills including means in the drill mast for storing and handling a plurality of stem sections, wherein each stem storing and handling mechanism has lower and upper tracks with carriages mounting stem holding means movable horizontally along the tracks radially toward and from the axis of the drill stem. Toggle levers are connected to the carriages and moved by a power source, connected to one set of toggle

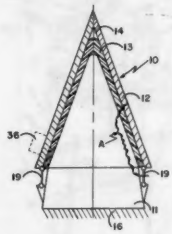


levers, and means interconnecting the two sets of levers. The movement of the stems is in a horizontal direction only.

3,613,907
MEANS FOR SEPARATING, EJECTING AND PROPELLING OVERLYING MEMBERS

Albert J. Spada, Wilmington, Mass., assignor to Avco Corporation, Cincinnati, Ohio

Continuation of application Ser. No. 701,461, Jan. 29, 1968, now abandoned. This application Aug. 6, 1969, Ser. No. 848,415
Int. Cl. B65g *1/14*
U.S. Cl. 214—10.5 **7 Claims**



The invention is directed to a means for separating members that overly one another. The separating means comprises a flexible bag that is placed between the members that are to be separated. The bag contains a gas under pressure. The pressure of the gas is greater than the ambient pressure at the time the members are to be separated. The two members are tied together by clamps. When the clamps are released, the bag inflates thereby causing the members to separate.

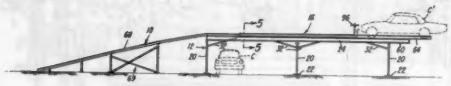
3,613,908
VEHICLE PARKING EQUIPMENT

Lewis Mulitz, Washington, D.C., assignor to Potomac Iron Works, Inc., Hyattsville, Md.

Filed Mar. 18, 1970, Ser. No. 20,636
Int. Cl. E04h *6/06*
U.S. Cl. 214—16.1 A **4 Claims**

A substantially skeletonized, welded vehicle storage system in which vertical columns support above an underlying storage area parking bay means comprising storage bays produced from parallel channel-shaped trackways in which

the trackways extend radially from an elevated turntable and comprise first and second generally parallel sets of trackways for accommodating different length vehicles, i.e., "compacts" and "conventional" lengths, and in which an inclined ramp is provided to direct vehicles to a conveyor ramp on the turntable whereby vehicles can be readily transferred to and from the storage bays: and further in which the conveyor ramp may include lift means and a



plurality of storage decks, substantially duplicating the lower storage bays, and which are accessible to the conveyor ramp as it is elevated; and in which the conveyor ramp is tiltable about its pivot axis whereby the center of gravity shifts to appraise one as to when a vehicle is substantially centered thereon; and in which a generally closed path of bearings are provided for engagement beneath the conveyor ramp, and the bearings generally comprise wheel elements disposed on an axis of rotation extending radially from the vertical axis of rotation of the conveyor ramp of the turntable.

3,613,909

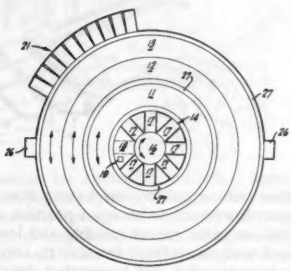
VEHICLE-PARKING SYSTEM

Charles R. Salloum, 154 Ellis St., San Francisco, Calif.

Continuation-in-part of application Ser. No. 404,622, Oct. 19, 1964, now Patent No. 3,378,151, and a continuation-in-part of 646,671, June 16, 1967, now Patent No. 3,382,990. This application Apr. 12, 1968, Ser. No. 720,952

Int. Cl. E04h *6/06*

U.S. Cl. 214—16.1 A **5 Claims**



The invention disclosed and claimed herein comprises an improved system for the efficient parking of automobiles and the like. The invention provides a plurality of vertically separated parking levels with each being composed of a plurality of concentric rotatable parking platforms. Of particular importance herein is the location of access and egress means for these parking levels. Elevators, or the like, are herein provided in a circular, or semicircular, array extending vertically through the plurality of parking levels about a central platform at each level. Such central platform may comprise a turntable to turn vehicles for ready movement outwardly to parking stalls.

By the above-noted arrangement, the present invention provides for minimizing the required number of elevators employed, while at the same time maximizing available parking space and facilitating fully automated vehicle parking or storage.

3,613,910

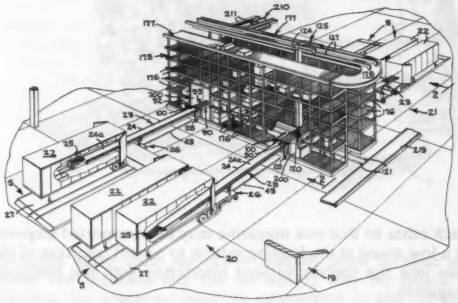
WAREHOUSE SYSTEM WITH INFEED AND DISTRIBUTING CONVEYORS SERVING STACKER CRANES IN A COMMON AISLE

Stanley M. Weir, Palo Alto, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed Mar. 18, 1970, Ser. No. 20,711

Int. Cl. B65g *1/06*

U.S. Cl. 214—16.4 A **16 Claims**



An automatic freight-handling terminal is disclosed with conveyor booms for loading and unloading freight to/from such transported containers, or carriers, as truck trailers, railcars, and aircraft igloos. Computer controlled equipment sorts, accumulates and moves freight from one loading-unloading conveyor boom to another. The loading-unloading conveyor boom is vertically adjustable with a ramp pivotally attached at one end that can be independently tilted up or down. The ramp has a set of movable wedge-shaped finger members for moving freight from its wedge-shaped finger tips to the conveyor boom or vice versa. All motions of the loading-unloading conveyor boom are controlled by an operator working in the vicinity of the ramp. The loading-unloading boom is of fixed length, and is pivoted by a motorized cart that also moves an air-bearing supported platform on which a freight carrier or container rests, backward or forward and sideways left or right.

Shipments are conveyed from loading-unloading booms to transfer stations where they are picked up by extendable stacker crane fingers of computer controlled stacker cranes which move back and forth between two rows of shipment-holding compartments and shift articles to and from holding compartments, transfer stations and the distribution conveyor.

The distribution conveyor is an endless continuously running conveyor loop located on top of the shipment-holding compartments. A magnetic belt coordinated with the distribution loop conveyor is used to record shipment-sorting instructions. A sorting instruction on a magnetic belt escorts each shipment while on the distribution conveyor to assist computer control of shipment disposition to another stacker crane for transfer to a compartment or another conveyor boom.

3,613,911

APPARATUS FOR AUTOMATIC DEPOSITING OF GLAZED TILES IN MAGAZINES ARRANGED FOR SUBSEQUENT FIRING

Ulrico Walchhuter, Quartiere Fiori, Edilnord Brugherio, Milan, Italy

Filed Oct. 7, 1969, Ser. No. 864,433

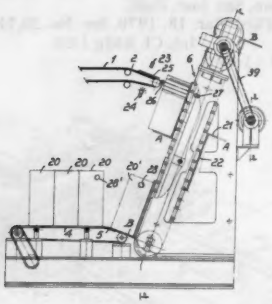
Claims priority, application Italy, Oct. 12, 1968, Sept. 26, 1969, 22419 A/68;22540 A/69

Int. Cl. B65g *1/06*

U.S. Cl. 214—16.4 R **15 Claims**

Apparatus for automatically depositing tiles onto shelves of magazines in which successive magazines are upwardly transported in a row by a pair of conveyors in upright condition with the shelves thereon spaced upwardly from each other from a lower conveyor belt to and beyond a loading station in which tiles arriving at an upper belt are

loaded onto the shelves of a magazine at the loading station, in which the pair of conveyors are driven in such a manner so that successive magazines will move toward and away from



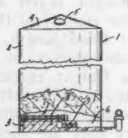
each other so that one magazine may be transported stepwise at a low speed at the loading station to permit insertion of the tiles into the shelves without interfering with the following magazine.

3,613,912

UNLOADING MECHANISM FOR SEALED STORAGE STRUCTURE

Fred W. Dissmeyer, Elgin, and George E. Olson, Arlington Heights, both of Ill., assignors to A. O. Smith Harvestore Products, Inc., Arlington Heights, Ill.

Filed Oct. 31, 1969, Ser. No. 872,814
Int. Cl. B65g *65/42*
U.S. Cl. 214—17 DA **16 Claims**



A mechanism for unloading a stored material from a sealed storage structure. The structure is supported on a foundation having a trough extending radially from the center of the structure to the exterior. Conveying members are located along the sides of the trough, while a stationary backbone or frame of a cutter arm assembly is positioned within the trough between the conveying members. The cutter arm assembly also includes a cutter arm which is adapted to rotate over the foundation and dislodge the stored material and convey the dislodged material to the center of the structure for delivery to the conveyors located within the trough. The conveyors act to convey the material within the trough to the exterior of the structure. The cutter arm assembly and conveying members are separate units and are independently driven so that the cutter arm assembly can be independently installed and removed from the storage structure.

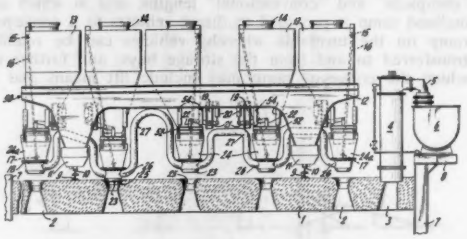
3,613,913

CHARGING TRUCK FOR COKING FURNANCE

Johannes Knappstein, Recklinghausen, Germany, assignor to Firma Carl Still, Recklinghausen, Germany

Filed July 18, 1969, Ser. No. 843,085
Int. Cl. C10b *31/04*
U.S. Cl. 214—35 R **8 Claims**

A charging truck particularly for charging coke to a coking furnace comprising a body portion which is adapted to be moved over the ground or over a rail structure and which carries a plurality of coal bunkers having outlets with extensions which are lowerable over the outer cases of a coking furnace and wherein the lowermost ends of the



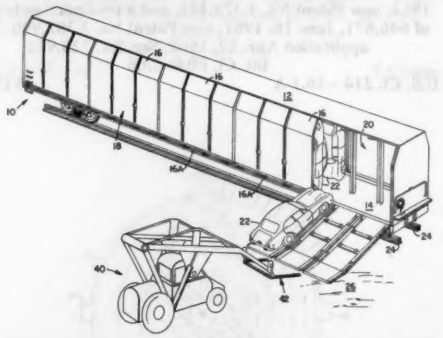
extendable portions are interconnected by means of flexible pipe connections between adjacent bunker outlets.

3,613,914

APPARATUS FOR OPENING AND CLOSING DOORS PIVOTALLY ATTACHED TO A RAILWAY CAR

William M. Jaekle, 18 Tarry Ave., Orinda, Calif.; Paul V. Garin, 1836 Lake St., San Francisco, Calif.; William E. Thomford, 1176 Glenwood Drive, Millbrae, Calif.; Wallace M. Greb, 1139 Oakes Blvd., San Leandro, Calif.; Nicholas N. Udaloff, 141 16th Ave., San Francisco, Calif., and Stephen H. Peery, Jr., 714 Birch Ave., San Mateo, Calif.

Filed Aug. 15, 1969, Ser. No. 850,491
Int. Cl. B65g *67/02*
U.S. Cl. 214—38 R **14 Claims**



In conjunction with a railway car having doors on either side which pivot downward to an open position and upward to a closed position, arm means raisable and lowerable and movable toward and away from the car to cooperate with slots in each door to raise and lower that door. Such arm means may enter the slots at openings at the tops and bottoms thereof but cannot be removed from the slots when in between these openings. Means are included to ensure that the arm means, after raising a door, cannot be removed from the bottom openings of the slots unless that door is locked in its closed position.

3,613,915

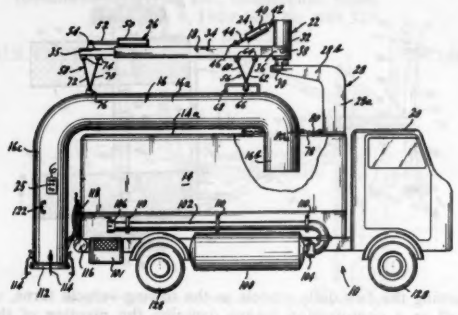
GARBAGE COLLECTION SYSTEM

Lawrence Vita, 1521 S.W. 21st St., Fort Lauderdale, Fla.

Filed Nov. 7, 1969, Ser. No. 874,928
Int. Cl. B65g *67/20*
U.S. Cl. 214—41 **11 Claims**

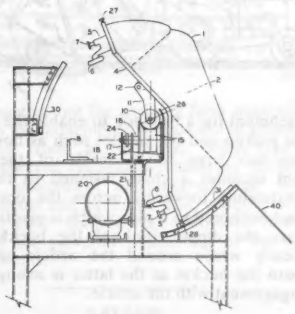
A mechanized garbage collection system comprises a sunken ground receptacle for storing garbage and a truck-mounted installation for extracting the accumulated garbage therefrom and conveying the same to the truck storage tank for eventual disposal at the dump. The truck-mounted installation includes a garbage intake pipe which is

connected to the mouth of the sunken receptacle and means for applying a vornado-type airblast at the bottom of the



sunken receptacle to drive the garbage out of the receptacle, through the intake pipe and thence into the truck storage tank.

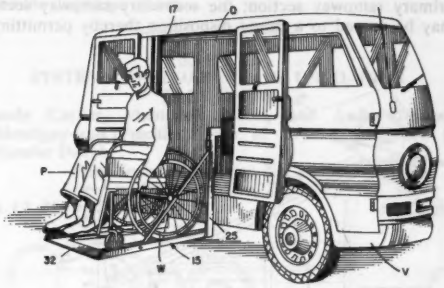
3,613,916
LUGGAGE CARRIER UNLOADER
Bernard Bradbury, Chico, Calif., assignor to Rex Chainbelt Inc., Milwaukee, Wis.
Filed Dec. 19, 1969, Ser. No. 886,520
Int. Cl. B61d *9/14*
U.S. Cl. 214—62 A **8 Claims**



A mechanism for unloading individual open top cars of a baggage-transporting system comprises an unloading station having a series of power-driven rollers arranged to engage and support a longitudinally extending member of the car frame about which the car pivots as the car moves through the station. The car tips as cam followers extending laterally from the car engage cam tracks mounted along the path of the car. A plurality of cam tracks may be provided to tip the car at selected discharge points and hold the car in tipped position during the remainder of its travel through the unloading station.

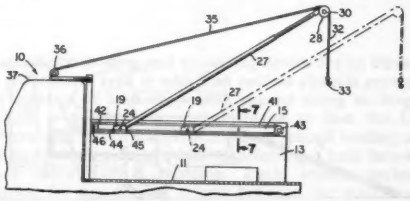
3,613,917
LIFT DEVICE WITH A PIVOTAL ELEVATOR PLATFORM
John H. Fowler, Jr., 2648 Hillside Lane, Evanston, Ill.
Filed Nov. 5, 1969, Ser. No. 874,273
Int. Cl. B60p *1/44*
U.S. Cl. 214—75 R **9 Claims**

A lift device particularly suitable for lifting wheelchairs and the like into a vehicle. The lift device includes a platform which can be used to raise and lower objects between the ground and the floor of the vehicle, and when the lift device is not being used, the platform can be folded compactly into the vehicle. The platform is pivotally supported at the ends of a pair of lift arms, and the other end of each of the lift arms is in turn pivotally secured to a housing slidably mounted on a generally vertical support post. A hydraulic piston is operatively connected to each of the housings for sliding the



housings along their respective support posts to raise and lower the platform and the lift device may be folded by pivoting the platform about its connection to the lift arms and by pivoting the lift arms about their connections to the housings.

3,613,918
FIELD SERVICE VEHICLE
Melvin W. Kruschke, 37756 Duvall Court, Fremont, Calif.
Filed Dec. 10, 1969, Ser. No. 883,923
Int. Cl. B60p *1/54*
U.S. Cl. 214—75 H **17 Claims**

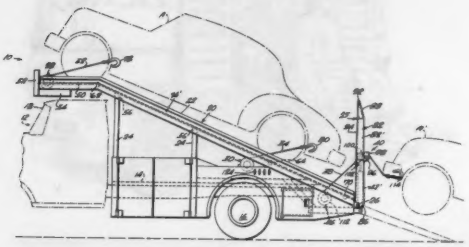


A field service truck having a boom that is movable fore and aft relative to the truck, along a pair of tracks lying above and at the sides of the truck bed, so as not to interfere with the holding capacity of the truck bed. A boom motor and winch acts through a cable to raise and lower the boom by swinging it about its lower ends; a hoist motor and winch control a cable for raising and lowering the load picked up by the hoist; and a travel motor acts through a chain drive to move the boom fore and aft of the truck. The travel motor is connected by differentials to the hoist winch and the boom winch, so that the boom can be moved fore and aft without substantially changing its height or the height of the load.

3,613,919
RAMP-TYPE WRECKER SERVICE VEHICLE
Arvo H. Ceepo, 7485 S.W. 128th St., Miami, Fla., and John Paul Jones, 121 N. E. 209th Terrace, Miami, Fla.
Filed Apr. 13, 1970, Ser. No. 27,627
Int. Cl. B60p *3/12*
U.S. Cl. 214—85.1 **8 Claims**

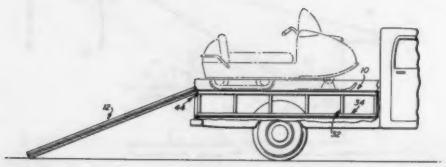
Load handling apparatus adapted to be mounted on an automotive service tow truck or wrecker truck configuration. The load-handling apparatus includes a primary ramp section extending upwardly and forwardly over the truck chassis unit and a secondary rampway section hingedly supported adjacent the lower end portion of the primary rampway

section. The secondary rampway section may be moved to a lowered inclined disposition defining substantially a continuation of the primary rampway section and providing bridgelike ramp means for permitting a disabled automobile load mass or the like to be drawn across the secondary rampway section and to a disposition bodily supported on the primary rampway section; the secondary rampway section may be moved to a raised disposition thereby permitting a



disabled vehicle or the like to be trailingly drawn in a semisupported disposition behind the automotive truck chassis unit. The secondary rampway section also supports a pulley over which a winch cable is reeved when the secondary rampway section is in a raised disposition and affords lifting and support pulley means for lifting and trailingly conveying a damaged or disabled automobile or the like.

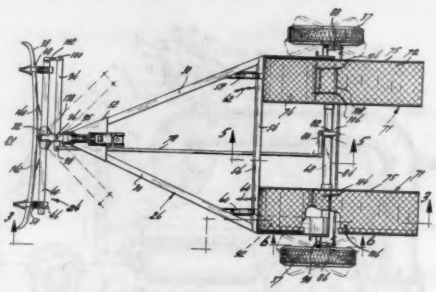
3,613,920
EQUIPMENT DECK AND RAMP
James R. Flamm, 227 E. Main, Rexburg, Idaho
Filed Feb. 18, 1970, Ser. No. 12,193
Int. Cl. B60p *1/44*
U.S. Cl. 214—85 **10 Claims**



Auxiliary support structure for a pickup truck box or the like consisting of a rectangular deck positionable between the sides of the box in overlying relation to the wheel covers and maintained by depending legs units or upwardly extending support straps for providing a full width support surface. An elongated ramp is selectively bracket engaged with the rear end of the deck for the introduction and removal of equipment. The ramp is selectively storable beneath the elevated deck.

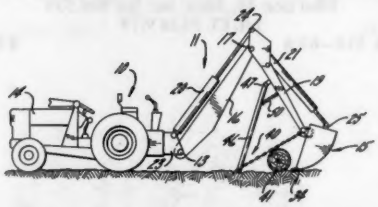
3,613,921
TOW DOLLY FOR WHEELED VEHICLES
James W. Ryden, Phoenix, and John C. Abromavage, Tempe, both of Ariz., assignors to Arcoa, Incorporated, Phoenix, Ariz.
Filed Aug. 26, 1969, Ser. No. 853,127
Int. Cl. B60p *1/44*
U.S. Cl. 214—85 **6 Claims**

A tow dolly for wheeled vehicles of the type embodying a chassis having a pair of arms converging as a trailer tongue at its forward end and supporting an axle and pair of wheels at its aft end. The chassis includes a pair of towed vehicle wheel ramps pivoted to act as a ramp for loading of the towed vehicle front wheels onto the chassis and configured to confine the front wheels during towing. The structure distinguishes from the prior art in combining these features with surge braking and linked steering mechanisms for



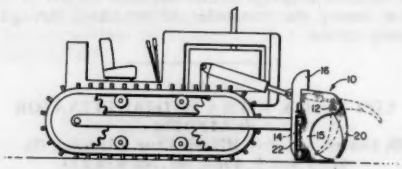
turning the two dolly wheels as the towing vehicle turns, as well as a compression means damping the pivoting of the wheel ramp during loading and towing.

3,613,922
ARTICLE-LIFTING ATTACHMENT FOR AN EXCAVATOR
Harry C. Clark, 226 W. Perry St., Belvidere, Ill.
Filed May 15, 1970, Ser. No. 37,535
Int. Cl. E02f *3/00*
U.S. Cl. 214—138 **7 Claims**



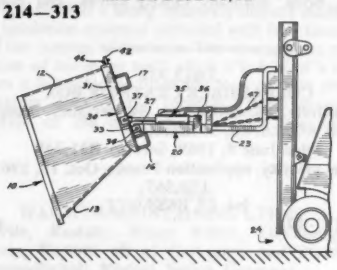
An attachment for a backhoe to enable the digging bucket thereof to pickup and lift articles such as boulders and logs which are too large to fit inside of the bucket. The attachment includes a chain fastened to the rear of the bucket, extending forwardly across the open side of the bucket and anchored to a pipe which is pivoted on and urged away from the dipper stick of the backhoe. The chain automatically wraps around the article and cinches the article onto the bucket as the latter is swung forwardly into lifting engagement with the article.

3,613,923
PICKUP ATTACHMENTS FOR LOADERS AND BULLDOZERS
Alva Z. Albright, P.O. Box 367, Port Barre, La.
Filed May 19, 1969, Ser. No. 825,599
Int. Cl. B66c *3/16*
U.S. Cl. 214—147 **1 Claim**



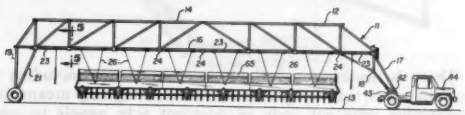
A pair of curved jaws horizontally pivoted together at the top to open and close at the bottom, and with an inner jaw vertically pivoted to a front corner of a bulldozer blade or to a loader to swing horizontally fore and aft, both pivotings being alternatively powered or free, and the bottom part of the inner jaw being horizontal and wedge shaped in side elevation to slide under elongated articles such as logs and pipes.

3,613,924
MATERIAL-HANDLING SYSTEM
Charles D. Monson, Coon Rapids, Minn., assignor to Inventors Engineering Inc., Minneapolis, Minn.
Filed July 9, 1969, Ser. No. 840,325
Int. Cl. B65b *21/02*
U.S. Cl. 214—313 2 Claims



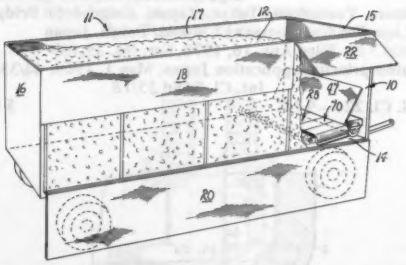
A material-handling system for factory or plant use wherein a plurality of scrap storage bins can be positioned in places where waste is to be accumulated, and a forklift mounted subframe can be used for picking up each of the bins separately, and tilting them to dump them.

3,613,925
IMPLEMENT CARRIER
Linly R. Stum, Box 297, Towner, Colo.
Filed Aug. 7, 1969, Ser. No. 848,157
Int. Cl. B60p *3/00*
U.S. Cl. 214—394 4 Claims



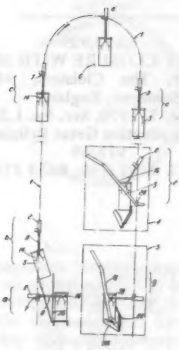
A wheel mounted unit for carrying farm implements from site to site with the implements hoisted above ground contact and suspended from an elevated bridge-type support structure by powered retractable chains or cables. A fifth wheel towing attachment and steered rear wheels are provided to support and guide the unit, which is of substantial length. Remote controls are provided for steering operations and for powered positioning of the implement suspension elements.

3,613,926
MATERIAL-CONVEYING MACHINE
Haskell C. Scroggins, 7701 E. Huntsman, Selma, Calif.
Filed Oct. 20, 1969, Ser. No. 867,849
Int. Cl. B60p *1/38*
U.S. Cl. 214—520 4 Claims



A material-conveying machine for substantially nonflowable materials having a tendency to cluster in an agglomerate mass such as cottonseed, moisturized grain, pelletized animal feed and the like, comprising a self-propelled frame adapted to move in a predetermined forward direction into a pile of such material including material discharge means mounted on the frame for transporting and depositing such material transversely outwardly from the pile and a material excavating member borne by the frame in forwardly edgewardly disposed relation to the discharge means to undermine a relative small portion of the material beneath the major portion of the pile during forward movement of the machine so that the major portion of the pile is left unsupported for immediate unrestricted gravitational descent upon the discharge means.

3,613,927
SYSTEMS FOR LOADING AND UNLOADING ELEVATORS
Claude Carlier, Montreuil S/Bois, and Andre Gravez, Montigny-les-Cormeilles, both of France, assignors to Saunier Duval
Filed Sept. 4, 1969, Ser. No. 855,115
Int. Cl. B65g *17/16*
U.S. Cl. 214—622 17 Claims



An automatic loading and unloading device for an elevator of the paternoster type in which an endless chain is provided with a number of load supporters spaced along its length. The chain is driven in a vertical plane so that the load supporters may be driven vertically past spaced loading and unloading stations such as when transferring a load between different stories of a building. Each station includes mechanism for transferring a load between the station and the load supporters on the chain. Each such mechanism is actuable in response to the presence of a selected load carried by the chain.

ERRATUM

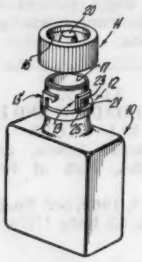
For Class 214—778 see:
Patent No. 3,614,273

3,613,928
SAFETY-CLOSURE DEVICE
William James Landen, Cheshire, Conn., assignor to Eyelet Specialty Company, Wallingford, Conn.
Continuation-in-part of application Ser. No. 70,749, Sept. 9, 1970. This application Dec. 28, 1970, Ser. No. 101,879
Int. Cl. A61j *1/00*; B65d *55/02*
U.S. Cl. 215—9 27 Claims

The invention contemplates selectively openable closure means that is tamperproof, in the sense that a correct sequence of two deliberate and independent movements of two parts is necessary in order to achieve access to the contents of the bottle or the like which is protected by the closure.

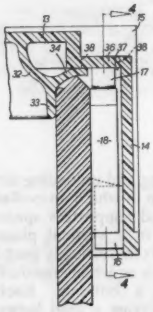
The specific construction that is described involves a bottle with a neck having a circular opening, and a closure cap having a cylindrical wall to overlap and lock to the outer surface of the neck. The closed end of the cap has an axially tapering yieldable section which engages the circular neck

opening in the course of closing the bottle. The nature of the lock is such as to preload the yieldable engagement and to



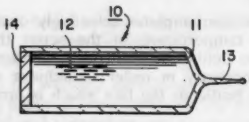
utilize the resilient action to retain the lock and to establish a liquid seal of the bottle contents.

3,613,929
SAFETY CLOSURE WITH SEAL
Eugene J. Treanor, The Cloisters, 94 Berrow Road, Burnham-on-Sea, Somerset, England
Filed Jan. 7, 1970, Ser. No. 1,276
Claims priority, application Great Britain, Jan. 7, 1969, 918/69
Int. Cl. A61j *1/00*; B65d *55/02*
U.S. Cl. 215—9 11 Claims



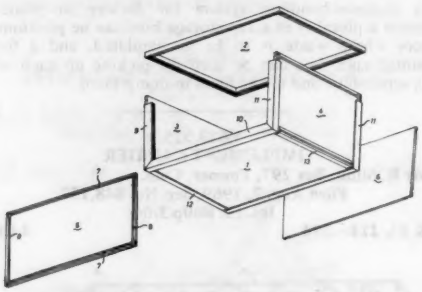
A childproof closure for a container including a top and complementary neck which cooperate together to provide a leak proof seal. The closure is characterized by having two locking positions with it being necessary to press the closure in twice while twisting in order to unlock the closure for removal.

3,613,930
EASILY DISINTEGRABLE STRUCTURES
David Z. Lippmann, 3411 Speedway, Apt. D4, Austin, Tex.
Filed Apr. 9, 1970, Ser. No. 26,830
Int. Cl. B65d *1/02*, *17/00*
U.S. Cl. 215—32 7 Claims



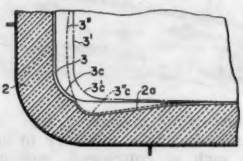
Disclosed is a structure having a main body portion substantially entirely composed of a frangible material, as tempered glass, having a narrow integrally joined tip member projecting from said main body portion, the fracturing of the tip resulting in the complete disintegration of the main body portion, the main body portion being extremely resistant to shocks thereto while said tip is integrally joined to it. Specific embodiments utilizing this structure are disclosed as containers, bolts, normally closed valves, and connecting rings.

3,613,931
COLLAPSIBLE CRATE OR BOX
Peter Schifferle, Rheinfelden, Switzerland, assignor to Holzwerte AG, Zurich, Switzerland
Filed June 9, 1969, Ser. No. 831,348
Claims priority, application France, Oct. 18, 1968, 170,567
Int. Cl. B65d *9/12*
U.S. Cl. 217—12 4 Claims



There is disclosed a collapsible crate or box including a bottom panel, sidewall panels and connecting strip means for connecting adjacent ends of adjacent side panels to one another and for connecting the side panels to the bottom panels. One face of all the panels is provided with grooves extending parallel to and in close proximity to the edges of the panels and each connecting strip means includes two channel-shaped strips disposed at an angle of 90° with respect to each other and having resilient legs and being narrowed at their mouths for cooperation with the grooves in the panels when the latter are inserted within the channels. Further, at least those connecting strip means associated between the sidewall panels and the bottom panel constituting hinge-forming connecting strip means and including a flexible web interconnecting the two channel-shaped strips of such connecting strip means.

3,613,932
LOW-TEMPERATURE LIQUEFIED GAS STORAGE EQUIPMENT
Katsuro Yamamoto, Tokyo, Japan, assignor to Bridgestone Liquefied Gas Company Limited, Tokyo, Japan
Filed Apr. 16, 1970, Ser. No. 29,139
Claims priority, application Japan, May 1, 1969, 44/33395
Int. Cl. B65d *25/18*
U.S. Cl. 220—9 LG 5 Claims



A storage tank and tanker for storage of low-temperature liquids such as liquefied gases. The tank is constructed as an inner container or vessel made of flexible metallic material supported or contained in an outer vessel or tank provided

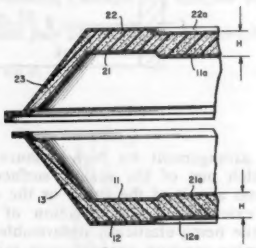
with a thermal insulation lining. The inner tank has its walls joined by elongated areas of jointure which are arcuate in cross section defining rounded edges of the tanks. The corners of the inner tank each have a configuration of a portion of a sphere and the arcuate areas of jointure join the corners to the walls merging therewith smoothly. The outer tank is rigid and has a lining interiorly thereof made of a rigid thermal insulation material provided with four recesses in the lining of the bottom of the tank. The recesses are spanned by the bottom of the inner tank when it is free of a cold liquid and when it is loaded or filled the four corners are received in respective ones of the recesses. These recesses allow deformation of the inner tank without concentration of stresses.

3,613,933

WARMTH-MAINTAINING UTENSILS

Erwin Pilz, Rastatt; Klaus Vetter, Offenburg; Rudolf Pankratz, Rastatt, all of Germany, and Stierlen-Werke Aktiengesellschaft, Rastatt, Baden, Germany

Filed Jan. 28, 1969, Ser. No. 802,312
Claims priority, application Germany, Jan. 30, 1968, P 17 53 152.1
Int. Cl. B65d *7/00*
U.S. Cl. 220—4 R **3 Claims**



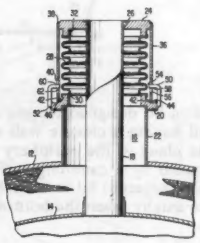
A two-sectional implement for retaining the heat of food to be served, which includes a bottom section adapted to receive a plate with food, and a top section adapted to fit and to be placed upon said bottom section to form a closed chamber therewith adapted selectively to be opened and closed, each of said sections comprising an inner wall and an outer wall arranged in spaced relationship to said inner wall and defining therewith a permanently closed chamber, and synthetic hard foam material filling said permanently closed chamber.

3,613,934

INNER CONTAINER SUPPORT STRUCTURE FOR DEWAR VESSEL

Kenneth R. Leonard, Boulder, Colo., assignor to Cryogenic Engineering Company, Denver, Colo.

Filed Jan. 3, 1969, Ser. No. 788,799
Int. Cl. B65d *25/00*
U.S. Cl. 220—14 **12 Claims**



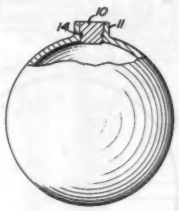
A dewar container has one end of a bellows supported above the outer wall and the other end connected to a closure plate affixed to the top of the inner container's neck tube so that the inner storage container is pendularly suspended from the outer wall by the neck tube and bellows. A cylindrical support surrounds the bellows and extends downwardly from the closure plate to a support adapter on the outer wall. The cylindrical support is free to move up and down with respect to the outer wall's support adapter as the inner container undergoes its pendular motion, but a tab and slot arrangement prevents more than a predetermined amount of both upward and rotational motion of the support with respect to the outer wall, while engagement of the support with the adapter limits downward motion of the inner container with respect to the dewar's outer wall.

3,613,935

CLOSURE AND METHOD OF MAKING THE SAME

Bernard Rogge, Baldwin, Md.

Filed Mar. 28, 1967, Ser. No. 627,253
Int. Cl. B65d *39/00*
U.S. Cl. 220—24 A **15 Claims**



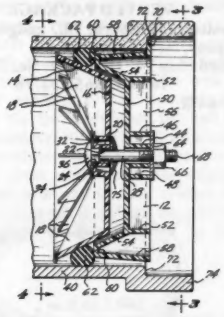
A seal for receptacles having generally a cylindrical opening closed by an unthreaded plug requiring no packing or compressible material to prevent leakage. The seal is accomplished by the sheared metal formed in an internal undercut of the plug of highly compressed metal and the contiguous surfaces of the sealing plug and wall of the cylindrical opening.

3,613,936

ADJUSTABLE DIAMETER PIPE CLOSURE PLUG

Arthur E. Kaiser, 17200 Brookside Blvd. N.E., Seattle, Wash., and Jefferson M. Fluke, 1811 10th W., Kirkland, Wash.

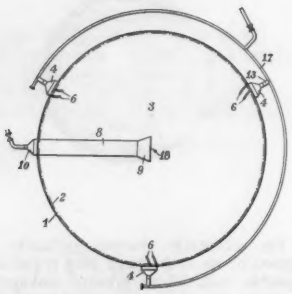
Filed Apr. 20, 1970, Ser. No. 30,077
Int. Cl. B65d *39/12*
U.S. Cl. 220—24.5 **8 Claims**



An elastomeric sealing ring is supported on a frustoconical support surface which surrounds a radial closure wall. A sealing-ring-positioning member is located axially endwise of the small diameter end of the sealing ring support. It includes an axial extension which concentrically surrounds the small-diameter end portion of the sealing ring support and has a generally radial end wall in contact with the sealing ring. A

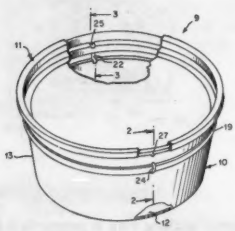
bolt extends axially between the radial closure wall and the sealing-ring-positioning member. A nut on the bolt is tightened to cause the sealing-ring-positioning member to move the elastomeric sealing ring up the frustoconical surface, to change its effective diameter. The large diameter end of the frustoconical support is faced towards pressure in the pipe so that pressure on the radial closure wall will make the sealing ring tend to roll further up on the frustoconical support and engage the pipe more tightly.

3,613,937
FLOATING ROOF HYDROCARBON TANK
Francis Schlecht, Versailles, France, assignor to Constructeurs Associes pour le Montage D'Ouvrages Metalliques, Paris; Constructions Metalliques de Provence, Levallois-Perret and Compagnie Industrielle Maritime, Paris, all of, France
Filed Apr. 15, 1970, Ser. No. 28,634
Claims priority, application France, Apr. 15, 1969, 69 11556
Int. Cl. B65d *87/18*
U.S. Cl. 220—26 R **3 Claims**



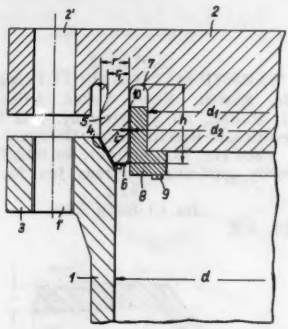
A hydrocarbon tank of the cylindrical vessel and floating roof type comprising at its base, on the tank skirt, fluid inlet nozzles in the form of flattened, ducts disposed near the bottom and provided with vertical curvilinear parallel baffle plates leaving a small gap between their outermost vertical edges and the adjacent tank wall in order to produce a whirling motion in the fluid, and a nozzle of same type connected to the discharge or draining pipe and to a radial duct in the form of a flattened tunnel.

3,613,938
VENTED PACKAGE
Robert F. Westcott, Hillsboro, Ill., assignor to International Paper Company, New York, N.Y.
Filed May 14, 1970, Ser. No. 37,096
Int. Cl. B65d *51/16*
U.S. Cl. 220—44 R **4 Claims**



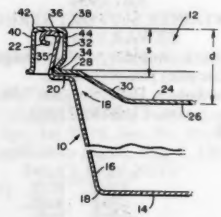
A plurality of venting means are provided in an annular, radially outwardly directed channel in the sidewall of a plastic container permitting the egress of gases formed by the contained foodstuffs while preventing deformation of the snap-on plastic closure lid.

3,613,939
CLOSURE FOR HIGH-PRESSURE CONTAINER
Joachim Ehle, Essen, Germany, assignor to Fried Krupp Gesellschaft mit beschranter Haftung, Essen, Germany
Filed Dec. 8, 1969, Ser. No. 883,246
Claims priority, application Germany, Dec. 14, 1968, P 18 14 721.2
Int. Cl. B65d *53/00*
U.S. Cl. 220—46 **9 Claims**



A sealing arrangement for high-pressure container and pipes, in which one of the sealing surfaces of a sealing structure forms a part of the cover or the container to be sealed and extends in axial direction of said cover or container while being elastically deformable in response to the pretightening pressure exerted upon said cover and in response to the full operating pressure developed in said container.

3,613,940
SLICE FEEDING LID
Paul Davis, Swampscott, Mass., assignor to Sweetheart Plastics, Inc., Wilmington, Mass.
Filed Mar. 31, 1970, Ser. No. 24,280
Int. Cl. B65d *43/10, 21/00*
U.S. Cl. 220—60 **10 Claims**

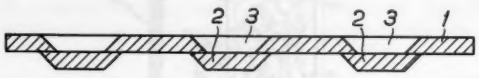


A slice feeding lid designed for use in automatic handling equipment and having a closure wall with a central portion offset from the plane of the periphery of the central portion and joined thereto by a camming surface which cooperates with an identical adjacent lid in a stack to cause the stacked lids to displace axially when the bottom lid is sliced from the stack.

ERRATUM

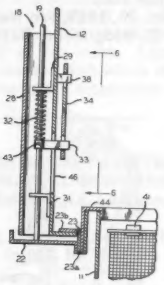
For Class 220—64 see:
Patent No. 3,613,957

3,613,941
TRANSFORMER TANK
Robert Koranyi, Ludvika, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden
Filed Nov. 21, 1969, Ser. No. 878,806
Claims priority, application Sweden, Dec. 5, 1968, 16616/68
Int. Cl. B65d 7/42
U.S. Cl. 220—71 4 Claims



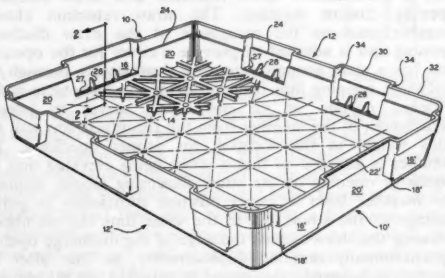
In a transformer tank the bottom is strengthened by cutting out rectangular plates with tapered edges so that the plates have the shape of truncated pyramids. The plates are placed under the holes formed when the plates are cut out of the bottom, the largest flat surface of each plate facing the side of the bottom where each hole is smallest. The plates are then welded to the bottom.

3,613,942
SAFETY CLEANING TANKS
Clarence E. Williams, Chicago, Ill., assignor to Justrite Mfg., Co., Chicago, Ill.
Filed July 24, 1969, Ser. No. 844,302
Int. Cl. B65d 25/00
U.S. Cl. 220—88 R 9 Claims



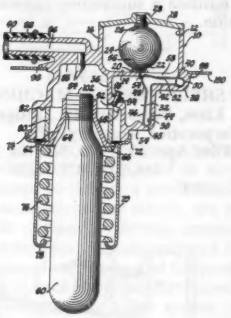
A cleaning tank featuring a safety cover having biasing means for automatic closing. A fusible link restrains the biasing means to enable the cover to remain open unless excessive ambient heat melts the link. When the link melts, the cover is automatically forced to close.

3,613,943
NESTING AND STACKING CONTAINER
Orville J. Bridenstine, Wayzata, Mich., assignor to Phillips Petroleum Company
Filed Dec. 31, 1969, Ser. No. 889,537
Int. Cl. B65d 21/04
U.S. Cl. 220—97 D 12 Claims



A nesting and stacking container provided with means to secure the containers together in stacked position. In a preferred embodiment, the container is also provided with means to prevent longitudinal and/or transverse movement when in stacked position.

3,613,944
SENSOR AND FRAGMENTIZABLE GLASS MEANS FOR RELEASING A PENETRATOR
Philip B. Zeigler, Pittsford; James C. St. Amand, Spencerport, and Ernst L. Ranft, Webster, all of N.Y., assignors to General Motors Corporation, Detroit, Mich.
Filed Dec. 5, 1969, Ser. No. 882,668
Int. Cl. B67b 7/24
U.S. Cl. 222—5 9 Claims

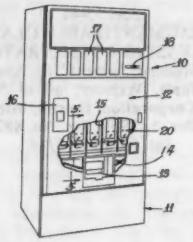


A sensor and trigger mechanism includes a ball of predetermined weight held against a pedestal-type seat by an adjustable screw. A sealed pressure vessel is biased axially toward a hollow penetrator pin and normally located in spaced relationship to the penetrator pin by a hollow frangible glass cylinder having a compressively stressed continuous outer surface skin or layer. A fragmentor pin is movably positioned to engage an outer edge of the glass cylinder to fragmentize the glass cylinder into segments and permit the seal of the vessel to be ruptured or penetrated by the penetrator pin so that the supply of pressure fluid within the cylinder can escape through the penetrator pin and into a manifold to inflate a restraint cushion. A spring member includes a first arm for engaging the fragmentor pin and a second arm which includes an integral detent portion for holding the first arm out of engagement with the fragmentor pin. The detent portion of the second arm is held in engagement with the first arm when the ball is seated. Upon application of a predetermined rate of acceleration change to the ball over a predetermined time duration, the ball slides off the seat and from underneath the adjustable screw to release the second arm and in turn release the first arm to engage the fragmentor pin and drive the pin into engagement with an outer edge of the cylinder to fragmentize the cylinder.

3,613,945
CAN-VENDING AND FEED MECHANISM
Donald C. Rockola, Chicago, and Floyd V. Bookout, Long Grove, both of Ill., assignors to Rock-Ola Manufacturing Corporation, Chicago, Ill.
Filed Aug. 21, 1969, Ser. No. 851,832
Int. Cl. B65g 59/00
U.S. Cl. 221—295 2 Claims

Solenoid-operated vend and feed gates interlocked with a linkage-actuated cam which is responsive to periodic actuation of an electrical solenoid; the mechanism being unified as a removable compact module located at the discharge end of a storage rack containing canned goods; the

same being operable, in response to customer selection and preconditioning coin deposit, to dispose canned items one at



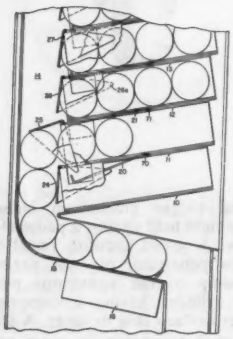
a time and position a succeeding canned item in a vend or release position.

3,613,946

SLANT SHELF VENDING MACHINE MAGAZINE

Franklin D. Klem, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 29, 1970, Ser. No. 32,925
Int. Cl. G07f *11/28*
U.S. Cl. 221—109 6 Claims



A slant shelf vending machine magazine is comprised of a plurality of superposed inclined shelves having their lower ends discharging into a substantially vertical passageway with an article control member associated in the storage space of the lower end of each shelf and movable in response to the presence of an article in the associated shelf into the shelf next above in a manner to block movement of an article therefrom into the passageway thus assuring substantially first-in and first-out delivery of articles to be vended.

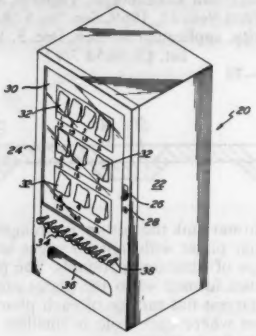
3,613,947

POUCH VENDING MACHINE

Henry Verbeke, Chester, N.J., assignor to Universal Vendors, Inc., Philadelphia, Pa.

Filed Nov. 19, 1969, Ser. No. 878,117
Int. Cl. B65g *59/00*
U.S. Cl. 221—125 14 Claims

A vending machine adapted to vend commodities that are packed in bags or pouches. The pouches are loaded in a spaced vertical alignment on a plate of a column of the machine. The bags are supported by retainers at their tops. A pivotally mounted pawl is provided for each spring clip, and all of the pawls are supported on a pawl bar, with one pawl bar for each plate. The pulling of a plunger permits the lowermost pawl to engage a retainer on a column, and disengage the retainer from its associated pouch. Each time the plunger is pulled, the next lowermost retainer will be disengaged from its associated pouch. When all of the bags in the column have been vended, the column will automatically be locked out against further vending. The vending machine



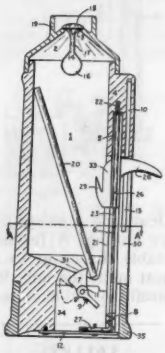
contains a plurality of columns, with a separate plunger for each column.

3,613,948

SANITARY SIPPING-STRAW DISPENSER

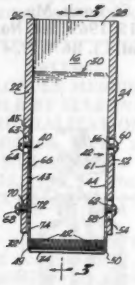
Leonard Atlee Wills, P. O. Box 7354 Benjamin Franklin Station, Washington, D.C.

Filed Oct. 20, 1969, Ser. No. 867,734
Int. Cl. B65g *59/00*; B65h *3/00*
U.S. Cl. 221—250 4 Claims



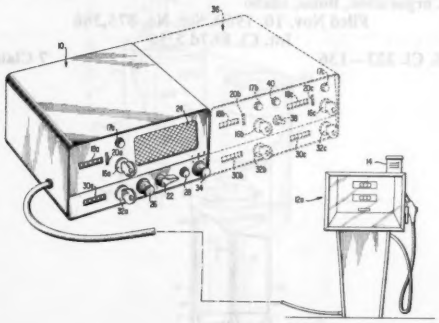
A sanitary straw dispenser, of the type having vertically reciprocable straw-dispensing means and wherein straws are supported standing on end within a receptacle, is provided with a combination straw retention and straw discharge opening closure member. The straw retention closure member rests on the receptacle at the straw discharge opening and is adapted to provide a cover for the opening, and has a stem portion extending downwardly through the discharge opening into the interior of the receptacle with a widened portion at its end which serves to prevent detachment of the member from the receptacle top wall and adds weight at this location for proper operation. The member is adapted so that a straw being elevated into the discharge opening by the straw-dispensing means, displaces the member from its cover position sufficiently to permit passage of the straw; but at the same time the member is pressing the straw against the edge of the discharge opening (gravitationally resisting displacement), so that after the ejector is lowered, the straw is retained at its elevated position by friction for withdrawal by a user. Upon withdrawal of the straw, the member returns to its closed position over the opening by operation of gravity.

3,613,949
DISPENSING APPARATUS FOR PLIABLE SHEET FORM MATERIAL IN STACKED RELATION
Peter R. Tripodi, Miami, Fla., assignor to Liggett & Myers Incorporated, New York, N.Y.
Filed Apr. 23, 1970, Ser. No. 31,119
Int. Cl. A47f 1/04
U.S. Cl. 221—310 6 Claims



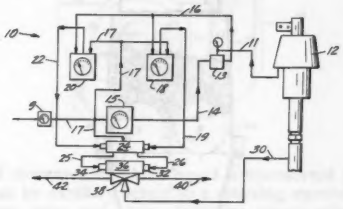
A dispenser for cyclically dispensing sheet material arrayed in stacked relation within the dispenser onto an assembly line during a packaging operation. The dispenser includes a receptacle having an open end partially spanned by a floor at one side only so that the main portion of the lowermost member of the stack is generally unsupported and tends to cantilever or bow downwardly of its own weight. Gripper fingers are provided embracing the sides of the stack to hold the unsupported end of the stack. Adjustment means are provided to vary the tension with which the unsupported end of the stack is restrained from withdrawal from the dispenser.

3,613,950
SYSTEM FOR REMOTELY CONTROLLING AND MONITORING FUEL-DISPENSING PUMPS
Charles R. Sauber, Raleigh, N.C., assignor to Aerotron, Inc., Raleigh, N.C.
Filed Aug. 25, 1969, Ser. No. 852,848
Int. Cl. B67d 5/30
U.S. Cl. 222—16 9 Claims



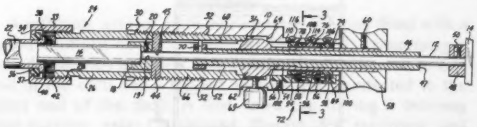
A system is provided for controlling and monitoring a plurality of remote fuel-dispensing pumps from a central location. An intercom circuit between the dispenser pumps and a control console will inform the console operator when to start operation of the system. When started, a transaction counter indicative of the dispenser pump selected by a pump selector switch will reset to zero and begin registering until a controlled preset time after pulses from a telemeter within the dispenser pump are no longer received. At this time, the system will turn off until again manually reactivated by the console operator. The central station communicates with the remote fueling stations by way of a single pair of wires impedance matched to the system.

3,613,951
PNEUMATICALLY CONTROLLED DISPENSING SYSTEM
Wilfred L. Muir, Maplewood, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed May 1, 1970, Ser. No. 33,627
Int. Cl. B67d 5/22
U.S. Cl. 222—36 5 Claims



The invention provides a pneumatically controlled dispensing system wherein the strokes of an air-operated fill pump, which is adapted to deliver a predetermined amount of fill material on each directional stroke, are sensed and a flow valve at a fill station is thereby controlled, which dispensing system comprises: (a) air-operated signal means for sensing each stroke of said pump and for producing an air pulse corresponding to each air pulse corresponding to each said stroke; (b) air-operated counter means for counting each air pulse produced by said signal means for producing an air pressure response signal after receiving a predetermined number of said air pulses; (c) flow valve means movable between a first and a second position for directing the flow of fill material delivered thereto from said pump between a first and a second outlet line; and (d) actuator means operated by said response signal of said counter means for moving said valve means between said first and second positions.

3,613,952
FLUID DISPENSER WITH ADJUSTABLE STROKE PISTON AND REGISTER
Roger Gilmont, Douglaston, N.Y., and Raymond E. Portyrata, North Haven, Conn., assignors to Cole Parmer Instrument Company, Chicago, Ill.
Filed Apr. 23, 1970, Ser. No. 31,088
Int. Cl. B67d 5/22
U.S. Cl. 222—43 18 Claims

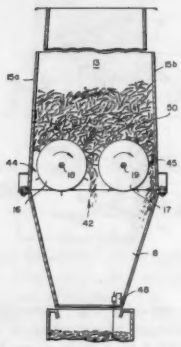


A digital dispenser comprises a cylinder-plunger assembly for accurately dispensing a measured amount of fluid from said cylinder. A rotatable screw jack is adapted to adjust the position of a stop member to define the length of the plunger stroke. A numbered wheel assembly is operatively connected to the screw jack through a rotatable knob whereby the stroke is set by rotating the knob and the desired volume appears on the numbered wheel assembly as a digital readout.

3,613,953
METHOD AND APPARATUS FOR FEEDING CIGAR FILLER AND THE LIKE

Eugene H. Paules, Red Lion, Pa., assignor to Yoe Leaf Tobacco Co., Yoe, Pa.

Filed Aug. 15, 1969, Ser. No. 850,398
Int. Cl. B67d 5/08
U.S. Cl. 222—56 11 Claims

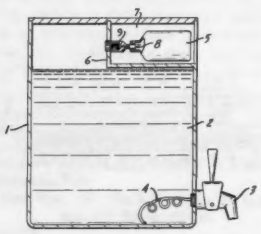


A system is disclosed of feeding filler for cigars to cigar-making machines. The bulk filler is fed to a hopper having sidewalls which slant outwardly from top to bottom, so that the filler does not bridge the sidewalls. At the bottom of the hopper there are two cylinders which have parallel horizontal axes, and which have feed pins or teeth which separate the filler and feed it downwardly through slots between the cylinders and also along the hopper sidewalls. The cylinders are rotated together in one direction, and they are started and stopped frequently and their direction is reversed each time they are stopped. The filler is picked apart and fed downwardly without objectionable breakage and in a precisely controlled manner.

3,613,954
DISPENSING APPARATUS

Peter D. Bayne, Shorewood, Wis., assignor to Jos. Schlitz Brewing Company, Milwaukee, Wis.

Continuation-in-part of application Ser. No. 574,971, Aug. 25, 1966, now abandoned. This application June 20, 1968, Ser. No. 747,061
Int. Cl. B67d 5/08; B65d 83/14
U.S. Cl. 222—61 61 Claims

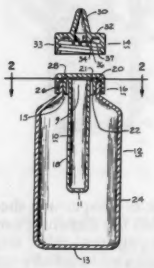


The invention relates to a dispensing unit for dispensing a beverage containing dissolved carbon dioxide and which utilizes a liquified fluorocarbon gas as a pressurizing medium. The unit includes a closed container containing a beverage having dissolved carbon dioxide. The liquified fluorocarbon gas is contained in a separate reservoir which communicates directly with the headspace of the container above the liquid level. As the beverage is drawn from the container, the volume of the headspace increases, thereby decreasing the pressure in the headspace and resulting in the vaporization of additional quantities of the liquified fluorocarbon gas which act to maintain the desired counterbalancing pressure within the headspace to keep the carbon dioxide in solution in the beverage.

3,613,955
COMPARTMENTALIZED CONTAINER PACKAGE

Richard B. Wetherell, Jr., Tolland, Conn., assignor to Monsanto Company, St. Louis, Mo.

Filed July 15, 1969, Ser. No. 841,819
Int. Cl. B67b 7/24
U.S. Cl. 222—83 6 Claims

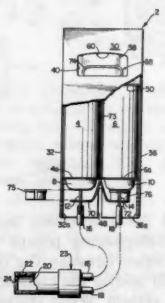


A compartmentalized container package for storing, mixing and dispensing ingredients which must be segregated prior to use including an inner container releasably supported within an outer container, a removable closure over the mouth of the inner container, and a dispensing cap having a projection which forcibly separate the containers when the cap is screwed onto the outer container to permit mixing of the contents. The releasable support means in a preferred embodiment has a frangible bridge section connected to the inner container and a laterally projecting surface resting on the wall of the outer container.

3,613,956
DISPENSING PACKAGE AND CONTAINER THEREFOR

Roger L. McCulloch, Elmhurst, Ill., assignor to Boise Cascade Corporation, Boise, Idaho

Filed Nov. 10, 1969, Ser. No. 875,366
Int. Cl. B67d 5/56
U.S. Cl. 222—136 7 Claims



Carton means adapted for use in connection with dispensing apparatus including a plurality of container means for simultaneously discharging separate pressure fluids, respectively, characterized by the provision of support means for supporting the containers in vertical side-by-side relation within and spaced from the ends of said carton, and carrying handle means adjacent the top of said carton for the manual

transport thereof in a vertical orientation. In accordance with one feature of the invention, valve-operating means are provided adjacent the handle means for operating the discharge valves of all the containers to permit a user with one hand to both carry the apparatus and to simultaneously operate all the discharge valves associated therewith. According to a second feature, the carton includes improved container support means comprising additional bottom panel means and handle panel means arranged at the lower and upper ends of the carton, respectively, for achieving a greatly strengthened rugged carton construction.

3,613,957

RESINOUS ENCLOSURE MEMBERS RENDERED IMPERMEABLE BY SULFONATION AND NEUTRALIZATION

Wilhelm E. Walles, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Oct. 25, 1968, Ser. No. 770,848
Int. Cl. B65d *25/34, 25/00*
U.S. Cl. 220—64 **17 Claims**

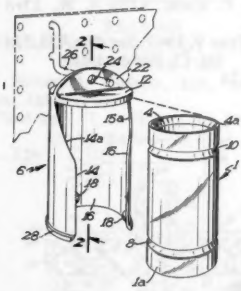
Resinous enclosure members are disclosed which are surface sulfonated and neutralized to the extent that they contain about 0.001 milligram to about 50.0 milligrams of sulfonate groups per square centimeter wherein the groups are selected from ammonium sulfonate, metal sulfonate and substituted quaternary nitrogen sulfonate groups. The treated enclosure members are rendered substantially impervious to the penetration of various solvents, gases, and vapors by this treatment. The enclosure members are useful to retain or transport hydrocarbon solvents, perfumes, fuels, etc. and thus can be used as gasoline tanks, perfume bottles, plastic hoses, etc.

3,613,958

MERCHANDISING AND DISPENSING CONTAINER

Theodore L. Opp, 825 8th Ave. South East, Aberdeen, S. Dak.

Filed Jan. 21, 1970, Ser. No. 4,505
Int. Cl. B67d *5/06*
U.S. Cl. 222—180 **4 Claims**



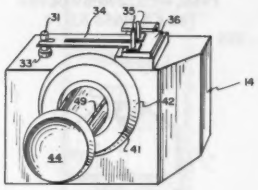
A cylindrical merchandising and dispensing container closed at one end and open at the opposite end is slidably housed within a generally cylindrical closure element having a transverse end wall which covers the open end of said container, said closure element having a longitudinally extending access opening in the cylindrical sidewall thereof, which serves as a dispensing receptacle for the material or articles in said container. Locking lugs at the opposite ends of said closure element releasably hold said container securely therein, and an apertured hanger flange peripheral support flange on opposed end portions of said closure element provide for the mounting and suspension of the container device in either an upright or an inverted position.

3,613,959

LIQUID DISPENSER

Anthony Mason, St. Joseph, Mich., assignor to Whirlpool Corporation

Filed July 18, 1969, Ser. No. 842,989
Int. Cl. B67d *3/00*
U.S. Cl. 222—187 **11 Claims**



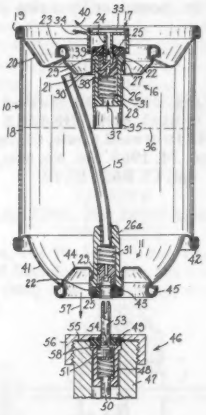
A liquid dispenser in which liquid is transferred from a container as by capillary action to a retaining member such as a spongy mass and then expressing means selectively compressing the retaining member at the desired time to force expressed liquid therefrom and conveying means such as a trough structure for conveying the expressed liquid away from the retaining member and the container.

3,613,960

REFILLABLE AEROSOL CONTAINER

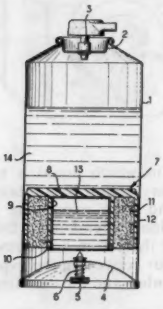
Walter C. Beard, Middlebury, Conn., assignor to Aerosol Systems, Inc., Middlebury, Conn.

Filed Dec. 6, 1968, Ser. No. 781,819
Int. Cl. B65d *83/14*
U.S. Cl. 222—330 **11 Claims**



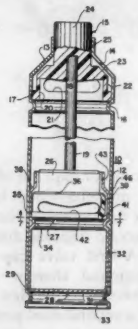
A refillable aerosol container capable of being filled with a liquid formulation to a predetermined level, comprising a cylindrical shell having a first annular disc connected to one end of the shell and a second annular disc connected to the other end of the shell. A first valve cap having a two-way dual-purpose valve positioned therein for receiving and dispensing liquids is connected to the first annular disc and a second valve cap having a second dual-purpose valve located therein for dispensing liquids is connected to the second annular disc. Nozzle heads may be added to the dual-purpose valves so that the valves can be used to spray liquids. Additionally, a dip tube having an internal diameter of one thirty-second to eight thirty-seconds of an inch is located on the first dual-purpose valve and a straight dip tube having an internal diameter of three-sixteenths to ten-sixteenths of an inch is located on the second dual-purpose valve. In place of the straight dip tube, a U-shaped dip tube having an internal diameter of one thirty-second to eight thirty-seconds of an inch may be used on the second valve.

3,613,961
DISPENSING CONTAINER
Bruno Morane, Paris; Charles Paoletti, Aulnay sous Bois; Louis Merrien, Fontenay sous Bois; Robert Sathicq, Villepinte, and Manlio Maurelli, Vaujours, all of France, assignors to L'Oreal, Paris, France
Filed Feb. 2, 1970, Ser. No. 7,691
Claims priority, application France, Feb. 3, 1969, Mar. 12, 1969, 69 02290;69 06986
Int. Cl. B65d 83/14
U.S. Cl. 222—389 13 Claims



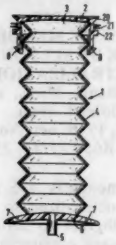
A container for fluids which are to be pressurized at the moment of use comprising a dispensing valve at one end, a free piston slidable within the container, and a base encircling a slidable pin at the bottom of the container. The lower face of the piston carries a separate rupturable cartridge of pressurizing fluid positioned to be ruptured when the pin is forced inward, and a flexible peripheral flange which is urged against the wall of the container by a ring of resilient foam material.

3,613,962
DISPENSING CONTAINER FOR FLOWABLE PASTY MATERIAL AND THE LIKE
Frank L. Boone, 3448 Driftwood Circle, Cincinnati, Ohio
Filed Sept. 24, 1969, Ser. No. 860,499
Int. Cl. B65d 83/14
U.S. Cl. 222—389 5 Claims



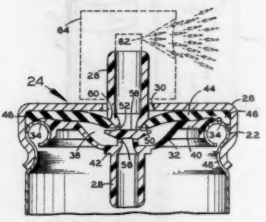
A dispensing container for flowable or pasty material which includes a pressure fluid container mounted in a body of a dispensing container at one end thereof. A resilient closure fitting is mounted at the other end and normally closes a discharge opening. When the resilient closure fitting is deformed, the discharge opening is opened. An actuator rod mounted in the closure fitting actuates the pressure fluid container to release gas under pressure which drives a piston along the dispensing container to discharge contents thereof.

3,613,963
CONTAINER FOR THE STORAGE AND DELIVERY OF A FLUID OR PASTY MATERIAL
Otto Berkmuller, 14a Willibaldstrasse, 8 Munich 21, Germany
Filed Oct. 27, 1969, Ser. No. 869,670
Claims priority, application Germany, Oct. 31, 1968, P 18 06 461.4
Int. Cl. B67d 5/42
U.S. Cl. 222—389 8 Claims



A tube or like hollow cylindrical container for the storage and delivery of a fluid or pasty material has an insert fitted into one end. The insert comprises a piston axially movable along the tube, a bottom for the container, a bellows-type bag containing gas under pressure and acting between the container bottom and the back of the piston and spring hooks on the piston engageable with holes in the container bottom so that the piston is prevented from moving away from the container bottom, the hooks being releasable from the outside when material is to be delivered from the container. Various modifications of this constructions are described and illustrated.

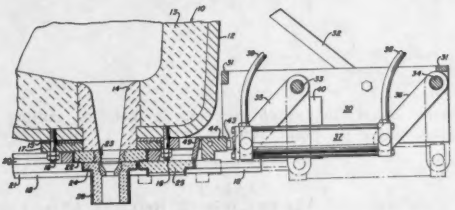
3,613,964
VALVE AND MOUNTING
Erich W. Gronemeyer, 2100 S. Ocean Lane, Fort Lauderdale, Fla., and Louis F. Kutik, 8720 S. W. 23rd Place, Fort Lauderdale, Fla.
Filed June 9, 1969, Ser. No. 831,374
Int. Cl. B65d 83/14
U.S. Cl. 222—402.24 5 Claims



A valve for discharging the pressurized contents of a container and including a valve stem having extending from its outer surface a flexible flange or membrane, and a sealing ring butting against the membrane on the upper side thereof, the sealing ring and the membrane being clamped against an open mouth of the container by an annular retainer which encircles the peripheral portions of the sealing ring and membrane and is attached to the container. In one embodiment, a second sealing ring is interposed between the membrane and the mouth of the container, and in another embodiment the peripheral portions of the first sealing ring and the membrane are clamped directly against the mouth of the container. The membrane has a relatively thin, flexible portion shaped to urge a sealing portion of the valve stem

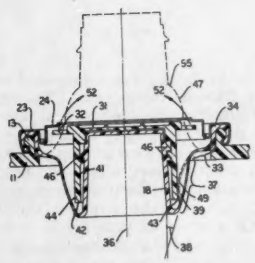
against the sealing ring to provide a seal. The valve stem has at least one opening within and blocked by the sealing ring, and also has means to allow pressurized contents of the container to be introduced into a space between the sealing ring and the membrane. When the valve stem is pushed, either by depressing it or tilting it, the sealing ring is bent to uncover the valve stem opening within the same, thus allowing the container contents to be discharged.

3,613,965
OPERATING AND LOADING MECHANISM FOR SLIDABLE GATES
Earl P. Shapland, Champaign, Ill., assignor to United States Steel Corporation
Filed June 25, 1969, Ser. No. 836,323
Int. Cl. B67d *3/00*
U.S. Cl. 222—505 **4 Claims**



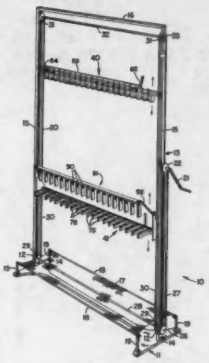
An operating mechanism for slidable gates used to control flow of material from a bottom-pour vessel. Mechanism includes a cylinder and reciprocable ram for shoving gates into vertical alignment with vessel outlet. Gate may be either a blank for closing the outlet, or provide a nozzle to permit pouring. As each gate is shoved into alignment with the outlet, it shoves the preceding gate on past. Cylinder is supported on pivoted links, whereby it can swing out of the way to facilitate loading a new gate into a "ready" position.

3,613,966
NESTABLE POURING SPOUT WITH WALL-SUPPORTING CAP
Kenneth L. Summers, Hudson, Ind., assignor to Rieke Corporation, Auburn, Ind.
Filed Apr. 17, 1969, Ser. No. 817,007
Int. Cl. B67d *3/00, 5/06*
U.S. Cl. 222—529 **9 Claims**



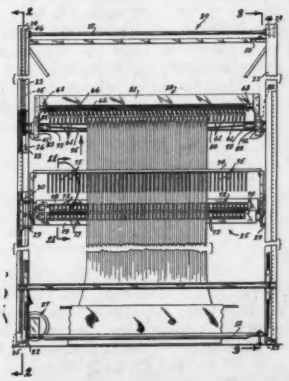
A nestable pouring spout has a flexible wall with a portion reversible in curvature upon extension of the spout, and which is circumferentially supported by a portion of a spout-closing cap when the spout is in nested position.

3,613,967
DRAPERY PROCESS MACHINE
Vernon D. Clement, 5939 Mack Road, Sacramento, Calif.
Filed Mar. 16, 1970, Ser. No. 19,657
Int. Cl. A41h *43/00*; **D0bj** *1/00, 1/06*
U.S. Cl. 223—32 **8 Claims**



A drapery-processing machine includes an endless loop elevator drive associated with opposite sides of a vertical rectangular frame with a drapery support bar and a pleater bar connected to the elevator drive in a manner causing them to simultaneously move away from and toward a central point while tracking on the sides of the frame and which also includes an indexing system to continuously register their relative separation. Included in the drapery support bar are a plurality of special locking lugs which can be independently or simultaneously released for securely holding the top pleats of a drapery and the pleater bar includes several pleater combs which are shifted laterally to grip the bottom pleats on both sides of their respective folds on opposite sides of an associated pleating paddle inserted between each fold whereby the drapery can be properly stretched to the proper length without damaging the fabric during finishing operations.

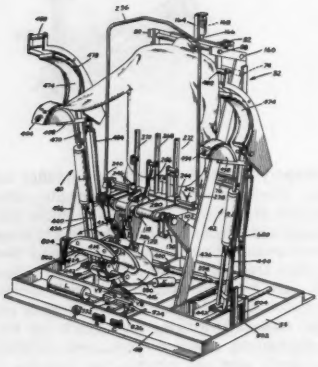
3,613,968
DRAPERY PLEATING, FOLDING AND STRETCHING APPARATUS
Robert M. Kirche, 411 W. Arbor Vitae, Inglewood, Calif.
Filed Dec. 4, 1970, Ser. No. 95,068
Int. Cl. D06j *1/00, 1/10, 1/12*; **A41h** *43/00*
U.S. Cl. 223—32 **16 Claims**



An apparatus for pleating, folding and stretching a drapery including a drapery support assembly that is extendible

thereby increasing the drapery length capacity of the apparatus, and a new and improved drapery clamping assembly for applying a firm and uniform clamping to the lower folds of a drapery supported on the apparatus for stretching purposes.

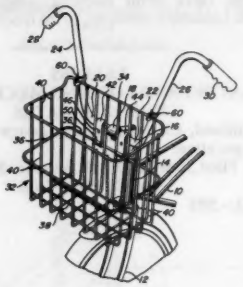
3,613,969
SHIRT PRESS
Harry D. Forse, 220 Woods Road, Anderson, Ind.
Filed May 5, 1970, Ser. No. 34,819
Int. Cl. A41h *43/00*; **D06f** *71/00*, *73/00*
U.S. Cl. 223—57 **41 Claims**



A machine for pressing and finishing an entire shirt including the front, remainder of the body, sleeves, cuffs and collar. The machine includes a vertical, heated, shift front pressplate and a buck adapted to have the body of a shirt dressed thereon with the front of the shirt engaging a surface of the buck. An inflatable bag is attached to the buck, the bag being adapted to have the portion of the shirt body which is not in engagement with the buck surface dressed thereon. The buck is movable between a horizontal dressing position, and a vertical pressing position with the shirt front in pressing engagement between the pressplate and the buck surface. A blower forces air into the bag when the buck is in the pressing position thereby to inflate the bag and the body portion thereon to dry the same. A pair of cuff pressing assemblies each including a buck and heated pressplate are provided on opposite sides of the shirt front pressplate. A collar pressing assembly including a heated press plate and buck are provided beneath the body buck. The shirt body is dressed on the body buck and bag in its dressing position, the body buck and bag with the shirt body thereon being then raised to the vertical, pressing position. The cuffs are then respectively arranged on the cuff pressing assemblies and the pressing and air-blowing operation is then commenced. Meanwhile, the collar of another shirt is being pressed on the collar pressing assembly.

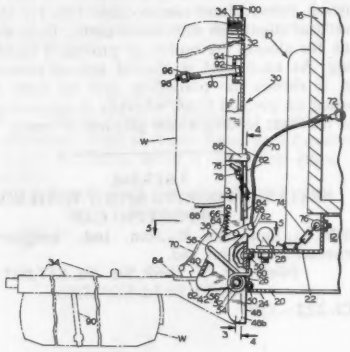
3,613,970
MOUNTING MEANS FOR BICYCLE BASKETS
Robert F. Humlong, Maysville, Ky., assignor to Wald Manufacturing Company, Inc., Maysville, Ky.
Filed Mar. 30, 1970, Ser. No. 23,711
Int. Cl. B62j *7/06*
U.S. Cl. 224—36 **14 Claims**

The bicycle basket receives support solely from the "high-rise" handlebar, and is suspended in part below the level of the steering post so as to lower the center of gravity of the basket and its contents. The basket mounting means and the



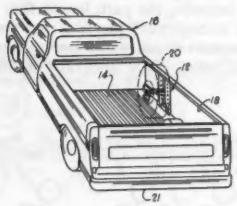
basket itself are simplified, and involve no cutting or weakening of the basket frame wires.

3,613,971
COMBINATION SPARE WHEEL HOLDER AND STEP FOR PICKUP TRUCKS
George J. Betz, 4720 N.E. 31st Ave., Portland, Oreg.
Filed May 12, 1969, Ser. No. 823,720
Int. Cl. B60r *3/00*
U.S. Cl. 224—42.01 **8 Claims**



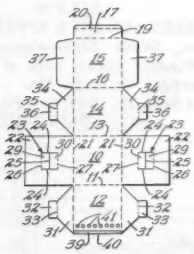
A flat platelike holder has a threaded lug for securing a spare wheel flatwise thereagainst. This holder has lower extensions pivotally connected to brackets in turn arranged to be secured to the bumper of a pickup truck. A spring operated catch is used for maintaining the holder in a vertical position and when released allows the holder to lower to a horizontal position. The vertical supporting position of the wheel holder comprises the normal or travelling position and the horizontal position of such holder comprises a position for use as a step. The lower extensions of the holder have a bottom edge adapted to serve as a stop against the bumper mounted brackets to hold the step in a substantially horizontal position, and springs are provided between the holder and the bumper mounting brackets to resist partly the lowering rotatable movement of the wheel and its holder. A release cable secured to the spring operated catch extends into a portion of the truck for emergency release of the step if necessary, and a safety chain is connected between the vehicle and an upper portion of the step to limit the amount of downward rotation of the step when desired.

3,613,972
SPARE TIRE BRACKET APPARATUS
Daniel W. Daughhetee, Hazelton, Kans.
Filed Nov. 17, 1969, Ser. No. 877,086
Int. Cl. B60r 9/02
U.S. Cl. 224—42.24 10 Claims



This invention relates to a spare tire bracket apparatus mountable within the rear end of a pickup truck or the trunk of an automobile including a support assembly secured to a support surface by an anchor assembly and a tire connector assembly secured to the anchor assembly which is readily mountable within a wheel member on a spare tire structure and movable into a locked condition preventing the same from being removed. More particularly, this invention relates to a tire connector assembly including a yoke assembly secured to a support assembly and having a threaded member operably connected to a lock clamp assembly wherein the lock assembly is movable from a nonuse to an attachment condition to secure a tire member thereto.

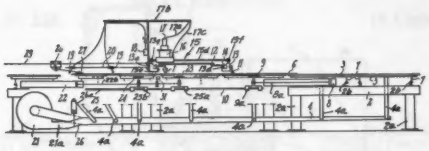
3,613,973
TAPE DISPENSING CARTON
Harold R. Jaeschke, Milwaukee, Wis., assignor to Hoerner Waldorf Corporation, Ramsey County, Minn.
Filed July 25, 1969, Ser. No. 844,957
Int. Cl. B26f 3/02; B65d 85/00
U.S. Cl. 225—47 10 Claims



A carton is provided for rotatably supporting a wide roll of material such as tape so that the tape may be dispensed. The full sized end flaps hinged to one carton wall are provided with opposed inwardly foldable flaps which are held in inwardly projecting position by flaps hinged to the ends of end wall flaps hinged to adjoining carton walls. Hollow rectangular supports are provided which extend into the core of the tape roll to rotatably support the same.

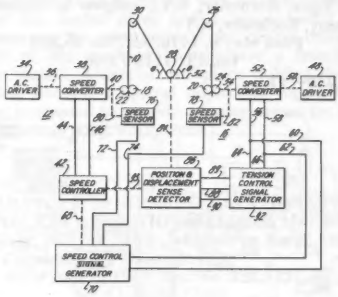
3,613,974
APPARATUS FOR CUTTING GLASS
Roger Chatelain, and Hugues Bouis, both of Thourotte, France, assignors to Compagnie De Saint-Gobain, Neuilly-sur-Seine (Seine), France
Division of Ser. No. 429,802, Feb. 2, 1965, Pat. No. 3,474,944.
Filed Mar. 10, 1969, Ser. No. 829,823
Int. Cl. B26f 3/06
U.S. Cl. 225—93.5 13 Claims

An apparatus to cut a length of flat glass into useful panels of any desired shape with as little as 1 cm. between contiguous scores of successive panels. Wastage of glass by



inefficient cutting is reduced. Heat is applied adjacent the scored line to effect the separation.

3,613,975
MATERIAL TRANSPORT TENSION CONTROL SYSTEM AND APPARATUS
Jack B. Knight, Richmond, Va., assignor to Philip Morris Incorporated, New York, N.Y.
Filed Dec. 30, 1969, Ser. No. 889,173
Int. Cl. B65h 23/22
U.S. Cl. 226—25 10 Claims

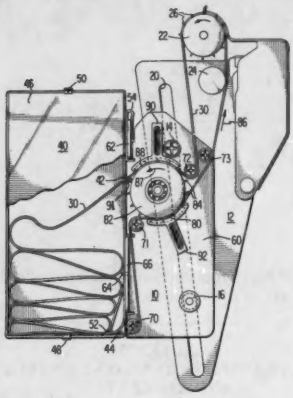


A system for controlling tension in transported material in continuous form involving detection of positional displacement and last sense of movement of a tension roller in continuous contact with the material and generation of tension control signals compensatingly affecting material supply or takeup rate, said control signals being generated only upon occurrence of particular conditions of roller displacement and last sense of movement. The system also includes means for generating said tension control signals in digital steps of time duration controlled by system tension correction performance.

3,613,976
APPARATUS FOR HANDLING ENDLESS TAPE
Michael Carl Guerrero; Robert Earl Justice, and Richard Miller Rudy, all of Palm Beach Gardens, Fla., assignors to RCA Corporation
Filed Feb. 19, 1970, Ser. No. 12,618
Int. Cl. G11b 23/06
U.S. Cl. 226—78 7 Claims

A relatively long endless tape is loosely stored in a relatively small container as a stack of loops lying one over another. One additional loop leading to opposite ends of the stack extends from the container. In use, the loop extending from the container is threaded over a drive roller which pulls the tape off one end of the stack and past a transducer. One

portion of the pulled tape engages and drives an idler mechanism. The latter, in turn, engages another portion of



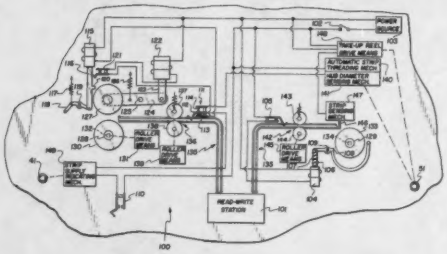
the tape and drives the tape back into the container at the other end of the stack.

3,613,977

MEANS FOR SECURING AND RELEASING STRIP END PORTIONS

John F. Egan, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 8, 1970, Ser. No. 35,802
Int. Cl. G11b *15/66*
U.S. Cl. 226—91 **20 Claims**



In a strip transport apparatus which is adapted for use with a cartridge of the type having a strip retaining member comprising a finger and barb that releasably engage one edge of an aperture in the leading end portion of a strip of web material wound on a reel in the cartridge interior, first and second members are actuatable to sequentially release such an engaged strip portion respectively from the barb and finger. In operation, the first member frees the engaged strip portion from the barb, and the second member feeds such partially free strip portion out of the cartridge interior while simultaneously drawing it off the finger. Thereafter, the released strip is fed into the interior of an empty cartridge of the same type, and one edge of an aperture in the trailing end portion of such feeding strip is sequentially engaged by the latter cartridge's finger and barb upon actuation of a strip guiding member of the apparatus.

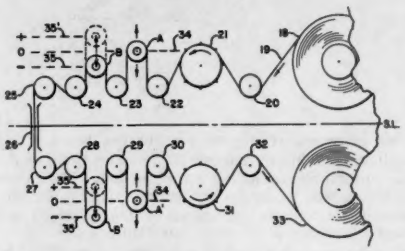
3,613,978

APPARATUS FOR INTERMITTENTLY MOVING FILM

Walter Renold, 7044 Mary Ellen Ave., North Hollywood, Calif.

Filed Oct. 7, 1969, Ser. No. 864,350
Int. Cl. G03b *1/24*
U.S. Cl. 226—117 **3 Claims**

An apparatus for intermittently moving film through a film gate for purposes of either exposure or projection particularly suitable for high-speed motion picture cameras, utilizes first and second roller arrangements on either side of the film gate in place of the conventional film loops. These rollers are caused to oscillate sinusoidally in such a manner as to increase the path length of film moving into the film gate and simultaneously decrease the path length of film leaving the film gate and thence reverse this motion to decrease the path length of film fed into the film gate and simultaneously increase the path length film leaving the film gate. With this arrangement the film may be payed out and taken up at constant speed while intermittent movement of film in the gate takes place and further the film is always



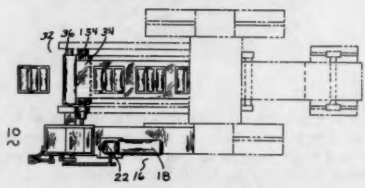
captured. By properly adjusting the oscillation speed of the rollers relative to the payout and takeup constant speed, a portion of the film in the gate is stationary during a period when the path length of film into the film gate is increasing and the path length of film from the film gate is decreasing, and moving at a speed substantially twice the constant payout and takeup speed during another period when the path length of film into the film gate is decreasing and the path length of film from the film gate is increasing. Pulldown claw arrangements are thus eliminated as well as free-type storage loops heretofore used and the instability problems associated with such loops when the camera or projector is operating at high speed.

3,613,979

SHEET ADVANCE APPARATUS

Bruce T. Jope, South Glastonbury, and Leonard J. Witkowski, Windsor Locks, both of Conn., assignors to Monsanto Company, St. Louis, Mo.

Filed Sept. 25, 1969, Ser. No. 860,874
Int. Cl. B65h *17/22*
U.S. Cl. 226—142 **5 Claims**



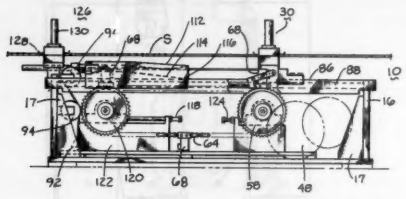
Apparatus for intermittently advancing successive equivalent length portions of a generally continuous sheet through an upstream article forming station. A gear assembly intermediate drive means and a sheet advance roll includes a Geneva assembly which, in combination with a brake on the roll, controls its acceleration and deceleration to provide smooth sheet movement. The extent of sheet displacement may be quickly changed by means of a lever having a portion mounted exterior to the housing of the gear assembly which, when rotated, changes the center distance between a rotary crank in the input drive train and a pivot shaft of the Geneva assembly which receives power from the input drive train.

3,613,980

SHEET ADVANCE APPARATUS

Frank M. Kulig, Bloomfield, and Lee R. Layman, Windsor Locks, both of Conn., assignors to Monsanto Company, St. Louis, Mo.

Filed Aug. 13, 1969, Ser. No. 849,780
Int. Cl. B65h 17/36
U.S. Cl. 226—162 12 Claims



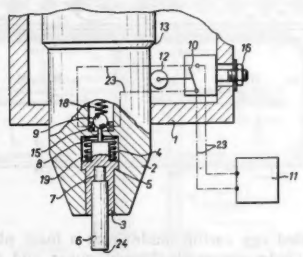
Apparatus for intermittently advancing successive equivalent length portions of a generally continuous thermoplastic sheet through upstream article forming and trimming stations. An indexing mechanism in the drive train controls the forward velocity of a carriage on which the sheet is clamped. Fixed stops precisely define the extent of forward movement of the carriage. A resiliently biased plunger in the means for interconnecting the drive train to the carriage absorbs the incremental and variable additional movement of the drive train caused by tolerances therein, after forward movement of the carriage and therefore of the sheet have been positively terminated through contact with the fixed stops.

3,613,981

SAFETY DEVICE FOR MACHINE TOOLS

Paul Ramseier, Pfaffikon, Switzerland, assignor to Bracker AG

Filed Dec. 11, 1969, Ser. No. 884,122
Claims priority, application Switzerland, Dec. 13, 1968, 18577/68
Int. Cl. B21j 15/16
U.S. Cl. 227—1 11 Claims



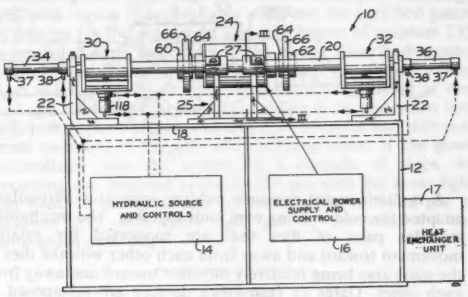
A safety device for machine tools with a tool advancing member in the form of a tool holder performing a tool operating motion during operation and having mechanism for the interruption of the operating motion in the presence of adverse or anomalous operating conditions. According to important aspects of the invention a primary switching or control means is provided for the purpose of interrupting the tool operating motion of the tool holder during a portion of its operating stroke if there is exerted on the tool member a pressure opposing the operating motion. Additionally, secondary switching or control means bridge the primary switching or control means or prevent such from moving into a breaking position as soon as the portion of the operating stroke of the tool has exceeded a predetermined value.

3,613,982

FRICTION WELDER

Dale W. Hollenberg, Rolla, Mo.; Calvin D. Loyd, Peoria, and Ronald L. Satzler, Metamora, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 13, 1969, Ser. No. 799,049
Int. Cl. B23k 27/00
U.S. Cl. 228—2 16 Claims



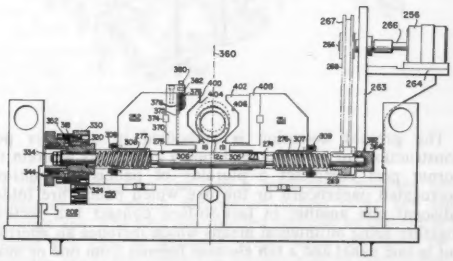
A friction welding machine has a direct center drive means wherein the rotor of the drive means functions as the workpiece holding spindle for one or more center driven workpieces; the machine is adapted for use as a dual welder wherein a movable tailstock is employed on each side of the center drive means and also for use with a single tailstock on one side of the center drive and a supplemental thrust bearing means on the other side of the center drive. One embodiment of the machine incorporates a free-floating center drive means. A special workpiece holding device is also provided wherein a special adjustable toggle linkage arrangement is adapted to provide gripping means for a large number of variously sized workpieces.

3,613,983

APPARATUS FOR HOLDING A STATIONARY WORKPIECE IN A FRICTION WELDING MACHINE

Arthur F. Gage, Warren, Mich., assignor to North American Rockwell Corporation, Pittsburgh, Pa.

Filed June 6, 1969, Ser. No. 831,827
Int. Cl. B23k 27/00
U.S. Cl. 228—2 7 Claims



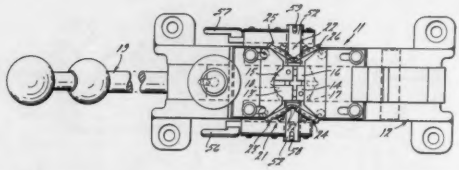
Apparatus and method for holding a stationary workpiece to be friction welded to a rotatable and axially movable workpiece, the apparatus including a pair of axially spaced-apart end clamps, a center clamp, and means for sequentially operating the clamps such that the end clamps initially grip the ends of the stationary workpiece at relatively low contact pressure, the center clamp then gripping the workpiece at relatively high contact pressure, and the end clamps then increasing the contact pressure with the workpiece to a relatively high level.

3,613,984

ADJUSTABLE GATE FOR BUTT WELDING MACHINE

Walter J. Rozmus, Hubbardsville, N.Y., assignor to Kelsey-Hayes Company

Filed Jan. 27, 1969, Ser. No. 794,171
Int. Cl. B23k 21/00; B23p 3/02
U.S. Cl. 228—3 9 Claims



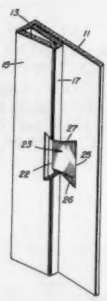
A multiple upset pressure welding apparatus particularly adapted for cold welding wire ends together. The mechanism includes pairs of dies that are supported for relative movement toward and away from each other with the dies of the pairs also being relatively movable toward and away from each other. Gates or restraining devices are juxtaposed to each of the pairs of dies for permitting movement of the wires toward each other during the welding process and for precluding reverse movement of the wires when the pairs of dies are retracted. The restraining gates are adjustable so as to accommodate different size wires and to permit gripping of the wires adjacent the respective dies.

3,613,985

CORNER POST

James R. Goodsite, Sandusky, Ohio, assignor to Westvaco Corporation, New York, N.Y.

Filed June 3, 1969, Ser. No. 830,001
Int. Cl. B65d 5/50
U.S. Cl. 229—14 C 6 Claims



The present invention is embodied in a corner post construction for reinforcing shipping containers wherein the corner post comprises a plurality of panels of multi-ply corrugated paperboard or the like which panels are folded adjacent one another in face-to-face contact and secured together using an integral means which includes an aperture cut in one panel and a tab element formed from one or more of the other panels.

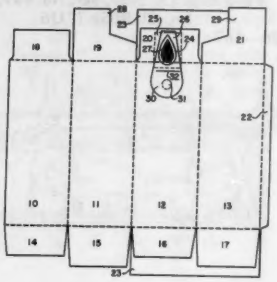
3,613,986

ARRANGEMENT IN PACKAGES FOR LIQUIDS WITH POUR OPENING

Od Wikar Christensson, Stockholm, Sweden, assignor to CEKA Packaging Limited, Zurich, Switzerland

Filed Sept. 18, 1969, Ser. No. 858,926
Claims priority, application Sweden, Oct. 29, 1968, 14603/68
Int. Cl. B65d 5/70
U.S. Cl. 229—17 R 11 Claims

A tubular cardboard liquid container having a plastic liner. End flaps form a flat top and a flat bottom. On an innermost top flap is formed a pouring opening comprising a hole through the cardboard and the plastic liner and a pair of additional plastic layers, one on the inside of the opening and one on the outside of the opening, the two layers welded to each other at the opening. A grip tongue is provided for tearing away the parts of the two additional plastic layers which are welded together at the opening to form the pour opening.

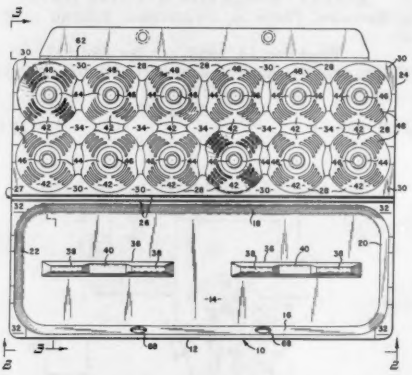


3,613,987

EGG CARTON

Robert Laidman, Orange, N.J., assignor to Plastimetrix Corporation and Alvin S. Bass, Washington, D.C., part interest to each

Filed July 10, 1969, Ser. No. 840,624
Int. Cl. B65d 85/32
U.S. Cl. 229—44 R 16 Claims



A molded egg carton made from a foam plastic material which includes integrally hinged cover and tray portions. Support beams protrude from the internal surface of said cover and cooperate with posts protruding upwardly from the interior of the tray portion when the container is in a closed position so as to protect against vertical stress, and separate the contents. The tray portion includes a plurality of cells having annular segmented cushion rings integrally formed therein in a stepped ascending manner towards the top of the cell in order to protect the contents against breakage.

3,613,988

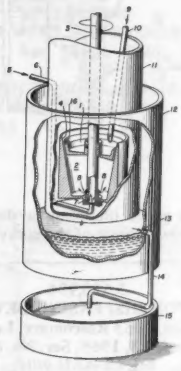
CONTROLLED-FORM CENTRIFUGAL PRECIPITATION APPARATUS

James S. Tapp, Kettering, Ohio; Robert E. Colwell, Simsbury, Conn., and Myron K. Toney, Greenwood, S.C., assignors to Monsanto Company, St. Louis, Mo.

Filed Mar. 19, 1969, Ser. No. 808,604
Int. Cl. B04b 3/00
U.S. Cl. 233—2 4 Claims

An apparatus for controlling the form of a precipitate is comprised of two coaxially rotating cuplike containers so

disposed and shaped that centrifugal force causes spillage of the contents of one container to contact spillage of the contents of the other container. The device is also provided with supply means for each of the containers, collection



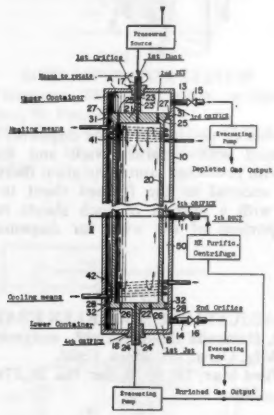
means for the liquids centrifuged from the containers and the solids precipitated during the centrifuge operation, and means for separating the precipitated solids from the centrifuged liquids.

3,613,989

GAS CENTRIFUGES, THEIR ASSEMBLY AND A PROCESS FOR ENRICHING URANIUM 235

Yoshitoshi Oyama; Yoichi Takashima, and Shigebumi Aoki, all of, Tokyo, Japan, assignors to Doryokuro Kakunenryo Kaihatsu Jigyadan, Tokyo, Japan

Filed Oct. 21, 1968, Ser. No. 768,981
Claims priority, application Japan, Oct. 26, 1967, 42-68490
Int. Cl. B04b *15/08*
U.S. Cl. 233—13 **27 Claims**



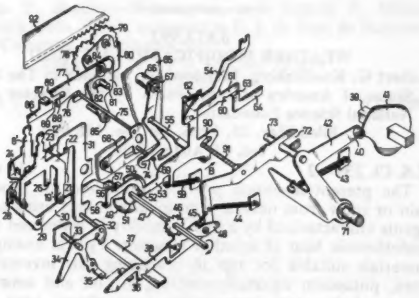
A gas centrifuge unit for assembly into a system for separation and enrichment of mixtures of gases according to minute differences between mass numbers of isotopes, each unit having an elongated rotor rotating at a high velocity within an outer cylinder, holes in each end of the rotor for the jetting of respectively enriched gas and depleted gas, calculated to establish a ratio of 1:1 of enriched uranium 235, containing gas mixture, to be jetted out of the upper holes to an upper chamber to depleted uranium 235 gas mixture jetted through the lower holes to the lower chamber, means to heat the upper rotor region and to cool the lower rotor region, an upper and a lower container and a circumferential chamber between them formed by the walls of the centrifuge housing and the rotor within it; orifices and means to supply a gas mixture into the rotor, and to withdraw gas mixture from the central region of the rotor, conduit means in the upper and the lower ends of the rotor to duct gas mixtures from the upper and lower regions of the rotor in the adjacent upper and lower containers, respectively, an orifice in the circumferential chamber to duct thereto gas withdrawn from the lower region of the rotor, orifices in the upper and lower chambers to withdraw therefrom, respectively, the gases collected there, and conduit means connecting each centrifuge unit with a successive centrifuge unit with means to controllably withdraw the enriched gases. A process for the separation and enrichment of uranium 235 comprising steps analogous to the above described means, whereby mixed uranium gas 235 is mixed with helium under high speed centrifugal force, simultaneously cooled at one end and heated at the other, thus aiding in its separation into different regions of gases of different mixtures and different mass numbers of isotopes and recycling some of the gases controllably into the system in a cascade of steps, by returning the depleted uranium 235 gas with the inner light gas back to the rotor and by feeding the enriched gas of uranium 235 with inert light gas to the rotor of the subsequent centrifuge.

3,613,990

APPARATUS FOR AUTOMATICALLY STORING BY MEANS OF A PROGRAM CONTROLLED SHAFT A PRODUCT OR QUOTIENT IN A CALCULATING MACHINE

Wilhelm Machmer, Moorenbrunn, Germany, assignor to DIEHL, Nurnberg, Germany

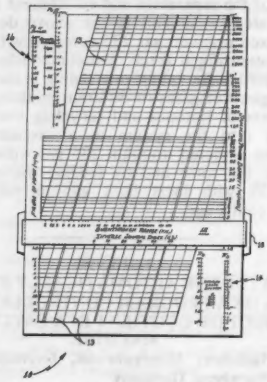
Filed Feb. 20, 1970, Ser. No. 12,971
Claims priority, application Germany, Feb. 21, 1969, P 19 08 667.0
Int. Cl. G06c *7/02, 23/00*
U.S. Cl. 235—60 R **6 Claims**



The specification discloses a calculating machine having function keys which include an actual value key and a storage key. The keys are coupled together so that the actual value key can be actuated alone while actuation of the storage key is prevented, but actuation of the storage key will also actuate the actual value key.

Actuation of the storage key releases a lever which, upon movement by a spring, couples a storage device to a value rack. According to the present invention, movement of the lever is prevented if the capacity of the machine is exceeded. Movement of the lever is also prevented except when the machine is in condition to provide the result of a multiplication or division operation. In the first instance of preventing movement of the lever, a capacity checking device interposes an abutment for the lever and in the second instance the program shaft of the machine interposes an abutment except when the program shaft is in certain rotated positions.

3,613,991
BACKLOBE-JAMMING BURNTHROUGH RANGE CALCULATOR
John S. Quinn, and Walter G. Murch, both of Dayton, Ohio, assignors to The United States of America as represented by the Secretary of the Air Force
Filed Mar. 10, 1969, Ser. No. 805,553
Int. Cl. G06c 3/00
U.S. Cl. 235—85 R 1 Claim



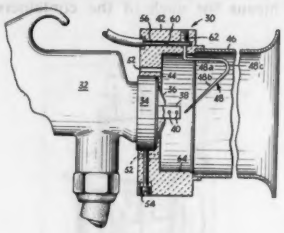
A calculator having a flat surface having two vertical scales thereon and a slideable rule having two horizontal scales thereon. The rule is capable of slideable motion in a direction parallel to the vertical scales. The flat surface further has a plurality of equally spaced parallel lines with a positive slope of four. By entering known values for three of the scales, the fourth scale determines the range at which radar can detect a target when the radar is being jammed in the backlobes by multiple standoff jamming platforms.

3,613,992
WEATHER MODIFICATION METHOD
Robert G. Knollenberg, Mattoon, Ill., assignor to The United States of America as represented by the Director of the National Science Foundation
Filed Mar. 25, 1966, Ser. No. 538,904
Int. Cl. A01g 15/00
U.S. Cl. 239—2 18 Claims

The present invention provides a method for producing rain or snow from natural atmospheric clouds using seeding agents characterized by a high solubility in water and a large endothermic heat of solution in water. Typical examples of materials suitable for use in practicing this invention are urea, potassium nitrate, potassium nitrite, and ammonium nitrate. Laboratory experiments have shown urea to be effective in producing ice crystals in a vapor cloud having a temperature as high as +6° C. In field experiments, urea has been observed to cause snow showers in supercooled clouds.

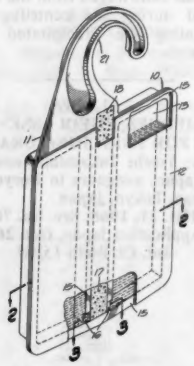
3,613,993
ELECTROSTATIC PAINTING METHOD AND APPARATUS
Meredith C. Gourdine, West Orange; Edward L. Collier, Morris Plains; Gerald P. Lewis, West Orange; Harold McCrae, Upper Montclair, and Donald H. Porter, Carlstadt, all of N.J., assignors to Gourdine Systems, Inc., Livingston, N.J.
Filed Oct. 28, 1968, Ser. No. 771,135
Int. Cl. B05b 5/02
U.S. Cl. 239—3 22 Claims

Apparatus and method for electrostatically charging a stream of atomized paint particles discharged from a spray gun. An emitter electrode is positioned in spaced relation to the end of the spray gun to establish a corona discharge from the electrode tip to a conductive portion of the gun end so that the direction of the discharge is opposite to the direction of flow of the particle stream. The apparatus may comprise an attachment unit for converting conventional spray guns to



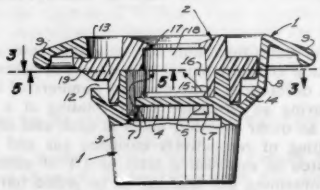
electrostatic spray guns, including a dielectric flow path-defining member downstream of the spray gun.

3,613,994
VAPOR-DISPENSING DEVICE
Richard E. Goodman, 1053 Roscomare, Los Angeles, Calif.
Filed June 23, 1969, Ser. No. 835,669
Int. Cl. A61l 9/04
U.S. Cl. 239—44 10 Claims



An insecticide or deodorant vapor dispenser comprised of a sheet formed with separate wick and fluid receiving depressions with restricted communication therebetween and a flat sheet secured to the formed sheet to enclose the depressions, with a portion of such sheets removable for exposing a portion of the wick for dispensing the fluid vapors.

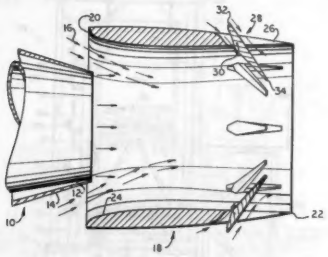
3,613,995
ADJUSTABLE SPRINKLER HEAD
Neil G. Kane, Hacienda Heights, Calif., assignor to Rain Bird Sprinkler Mfg. Corp., Glendora, Calif.
Filed Mar. 18, 1970, Ser. No. 20,576
U.S. Cl. 239—200 5 Claims



An adjustable sprinkler head formed of two injection molded plastic or die cast metal parts, including a body

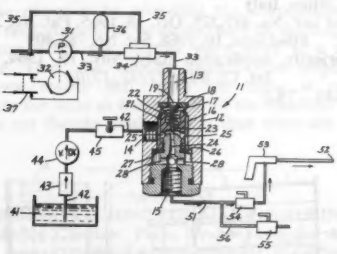
member arranged for connection to a riser and having a ring of upwardly directed water passages, and a nozzle member capping the passages and having a central outlet; the nozzle member being rotatably adjustable to control the volume of water discharge and the radius of the spray pattern.

3,613,996
EJECTOR WITH SUPPRESSOR CHUTES
Carole S. Tanner, San Diego, Calif., assignor to Rohr Corporation
Filed July 3, 1969, Ser. No. 838,851
Int. Cl. B64d *33/04*
U.S. Cl. 239—265.13 **3 Claims**



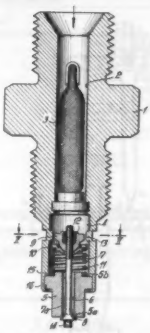
System includes ejector ring mounted behind nozzle of jet engine is to induce ambient air and mix it with exhaust gas stream. Mixing is increased an further air added and mixed by injecting discrete streams of air into interior of ring from points spaced around periphery. Streams enter transverse to flow of gaseous mixture. In preferred form, ring has longitudinally extending air passages with transversely pivoted vanes which swing to transverse angle to open passages and induce the additional air streams. Vanes lie flush with wall of injector ring in retracted position and extend inwardly and outwardly of the wall in deployed position.

3,613,997
ACID ASPIRATOR SYSTEM
Richard G. Thompson, Stillwater, Minn., assignor to L & A Products, Inc., St. Paul, Minn.
Filed May 18, 1970, Ser. No. 37,954
Int. Cl. B05b *7/26*
U.S. Cl. 239—310 **22 Claims**



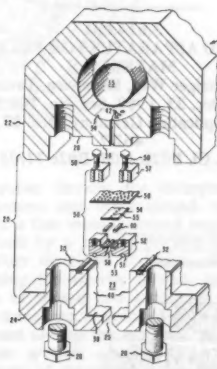
A hydraulic system which receives and pumps water at high pressure to a spray nozzle for washing and cleaning purposes. The system includes an aspirator-transfer valve downstream of the pump which functions to receive water from the pump and direct it to the spray nozzle under one cycle of operation, and, under a second cycle of operation, to block the major flow of water from the pump and aspirate cleaning acid from a separate source to be mixed with water in the valve and on to the nozzle without passing through the pump.

3,613,998
CLOSING SPRING ADJUSTING MEANS FOR A FUEL INJECTION VALVE
Rudolf Krauss, Stuttgart-Giebel, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany
Filed Oct. 28, 1969, Ser. No. 871,865
Claims priority, application Germany, Nov. 23, 1968, P 18 10 544.7
Int. Cl. B05b *1/32*
U.S. Cl. 239—453 **6 Claims**



A fuel injection valve which includes a valve needle urged against a valve seat by a closing spring which is disposed between a fixed part of the valve and a spring seat disc supported by a nut threadedly secured to the stem of the valve needle. For varying the preload of the spring, the valve needle is rotated, whereby said nut is axially displaced changing the extent to which said spring is compressed.

3,613,999
APPARATUS FOR JETTING LIQUID ONTO FIBROUS MATERIAL
Thomas P. Bentley, Wilmington, and Donald F. Miller, Newark, both of Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.
Filed Apr. 29, 1970, Ser. No. 32,979
Int. Cl. B05b *1/14*
U.S. Cl. 239—553.3 **6 Claims**



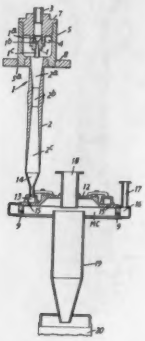
An apparatus for jetting high-pressure liquid streams into fibrous materials that includes a quick change cartridge device loosely fitted into a body member. The cartridge includes an orifice plate to produce the liquid streams and a filter between the source of pressurized fluid supplied to the jet and the plate. A seal between the cartridge and the jet body relies on internal operating pressure within the jet body to effect sealing action.

3,614,000

METHOD FOR THE COMMINUTION OF PARTICULATE SOLID MATERIALS

George E. K. Blythe, 37 Ashlawn Road, Hillmorton, Rugby, Warwickshire, England

Filed June 12, 1969, Ser. No. 832,779
Claims priority, application Great Britain, June 19, 1968, 29083/68
Int. Cl. B02c 19/06
U.S. Cl. 241—5 5 Claims



A process and apparatus for grinding particulate material to micron or fractional micron size. A high velocity stream of high pressure grinding fluid is passed through a multistage Venturi system into which the material is fed to result in self-attrition of particles by impact. Fluid and entrained material are injected into a mill chamber wherein particles of different sizes are separated and classified. Mill preferably shaped to provide an endless path. Patterns of hydrodynamic flow and vortex motion are produced in the chamber so that a solid particle makes many collisions, these conditions being effected by dispositions of high pressure fluid nozzles, design of solid boundary surfaces and regulation of pressure and temperature of oncoming high velocity fluid.

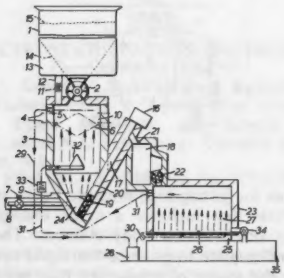
Provision is made for recycling the oversized particles either to the aforementioned multistage Venturi system or to a similar but separate system for regrinding and reintroduction into the chamber.

3,614,001

METHOD AND APPARATUS FOR PULVERIZING MATERIALS

Hans Beike, 15 Danziger Weg, Kronberg, Taunus, Germany

Filed Dec. 23, 1968, Ser. No. 786,179
Claims priority, application Germany, Dec. 27, 1967, P 16 07 462.7
Int. Cl. B02b 1/08; B02c 11/08
U.S. Cl. 241—23 10 Claims



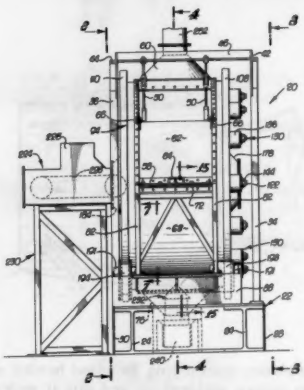
Material to be pulverized is passed into a countercurrent heat-exchanging relation with cold vapors produced by evaporation of a low-temperature liquefied gas. The material is then immersed into the liquefied gas and is pulverized in a mill.

3,614,002

DRY FINE CRUSHER

Robert F. Dore, Los Angeles, Calif., assignor to D'Ore Mills, Inc., Los Angeles, Calif.

Filed July 7, 1969, Ser. No. 839,498
Int. Cl. B02c 17/02, 17/10, 21/00
U.S. Cl. 241—51 14 Claims



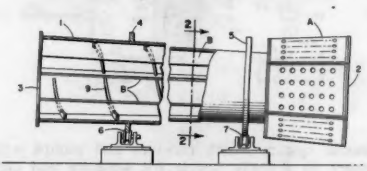
A dry fine crusher adapted to crush and partially grind portland cement "clinkers" and similar materials such as pozzuolana or other rocklike materials. The crusher includes a single entry port for the material to be crushed and partially ground as well as an upper exit port for finished dust material and partly finished material known as "fines," and a lower exit port for the discharge of material for further processing. The crusher includes a plurality of aligned crushing ring liners spaced apart a preselected distance and a weighted crushing roller freely rotatable within the rings to crush and partially grind material therebetween for discharge through one of the respective exit ports.

3,614,003

APPARATUS FOR SELECTIVELY CRUSHING OF STORAGE BATTERIES AND SEPARATING THE COMPONENT MATERIALS

Gustavo Tremolada, Milan, Italy, assignor to A. Tonolli & C. S.p.A., Milan, Italy

Division of Ser. No. 497,375, Oct. 18, 1965, Pat. No. 3,456,886.
Filed Sept. 10, 1968, Ser. No. 785,409
Claims priority, application Italy, Nov. 19, 1964, 24722/64
Int. Cl. B02c 17/02, 17/04
U.S. Cl. 241—79.3 5 Claims



Apparatus for breaking up scrap lead storage batteries and for the screen separation of the active material thereof in a substantially pure state as powder or fine granules, from the other material of the batteries, comprising a revolving drum the axis of which is inclined towards the discharge end, the walls of the drum being furnished with lifting wings extending

in the axis direction for lifting and dropping batteries and their parts.

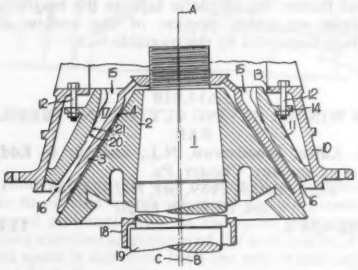
ERRATUM

For Class 241—202 see:
Patent No. 3,614,023

3,614,004
CONCAVE RING FOR CONE CRUSHERS

Edgar S. Burkhardt, Wauwatosa, and James D. Torrence, Milwaukee, both of Wis., assignors to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Filed May 26, 1969, Ser. No. 827,712
Int. Cl. B02c *2/04*
U.S. Cl. 241—214 **10 Claims**



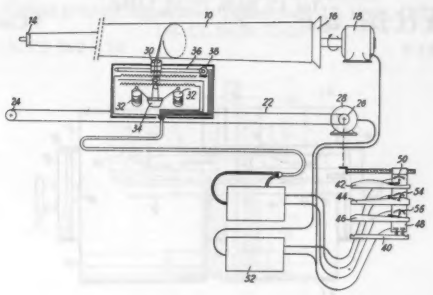
A crusher is disclosed of the type having a crushing chamber defined between a vertical conical head and a surrounding replaceable concave ring. The inside of the concave ring is provided with a stepped surface comprising alternately, annular crushing surfaces and annular connecting surfaces. The inside of the concave ring is also provided with vertical corrugations defined by alternate grooves and ridges which begin at the top and material inlet end of the concave ring, and extend downwardly to one of the annular crushing surfaces at a horizontal level above at least the lowermost annular crushing surface. The ridges of the corrugations provide a proper nip angle for crushing at the top of the chamber while the grooves provide a larger area feed opening than could be provided by a noncorrugated surface making a proper nip angle for crushing. The bottom crushing surface, which is below the corrugations, provides a smooth annular surface for fine crushing. When wear of this bottom crushing surface requires the cone to be raised, to restore predetermined spacing, the size of the feed opening at top is not reduced because wear is deliberately accelerated at the top of the chamber by providing the corrugations which cause the feed material to be nipped only by the ridges of the corrugations which are thereby worn away at a relatively rapid rate. Thus, the wearing away of the ridges of the corrugations means that when the cone is raised to compensate for wear at the bottom of the chamber the feed opening is not thereby made smaller than when the ring was new.

3,614,005
WINDING MACHINE FOR MAKING TUBING

Andre Maurice Chartier, Paris, France, assignor to R.D.T. Societe pour L'etude, La realisation et al. diffusion des techniques modernes

Filed Apr. 23, 1968, Ser. No. 723,404
Claims priority, application France, Apr. 25, 1967, 104,015
Int. Cl. B31c *13/00*; **B65h** *81/06*; **F17d** *1/08*
U.S. Cl. 242—7.22 **2 Claims**

Tubing is formed by glass fibers wound around and bonded together on a motor driven mandrel. The fibers can be wound in a honeycomb pattern having overlapping turns by a reciprocating guide carriage. The carriage includes a support reciprocated parallel to the mandrel axis by an endless belt driven in alternate directions by a fist motor. The support carries the fiber guide also reciprocable by an endless belt driven in alternate directions by a second motor. A plurality

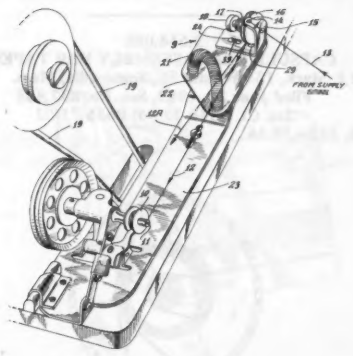


of cams operate associated variable resistors to control the first and second motors and thereby the relative position of the carriage and the guide on the carriage with respect to the mandrel.

3,614,006
THREAD CONTROLLER DEVICE

Julius Pararra, Bethel, Conn., assignor to William Deitch, New Haven, Conn., a part interest

Filed Nov. 14, 1969, Ser. No. 876,691
Int. Cl. B65h *54/00*; **D05b** *65/00*
U.S. Cl. 242—20 **7 Claims**

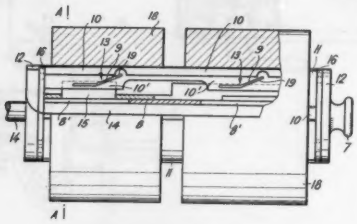


Thread controller devices for incorporation in bobbin winding mechanisms and other strand- or thread-carrying machines where a fast moving strand may be inadvertently caught and seized by a rapidly moving drive belt or gear train, which often develops a charge of static electricity strongly attracting the nearby thread, quickly drawing in large quantities of thread and producing a tangled jam of thread in the drive mechanism of the device before the operator can react to stop the machine. A helical coil spring is arched in an arcuate configuration with the radially innermost portions of the spring turns in contact while the radially outermost portions of the spring turns are angularly separated, creating a fanned array of wedge-shaped apertures with their openings presented laterally toward the endwise-moving strand rapidly passing the device. Inadvertent deflection of the strand from its path of endwise movement deflects the endwise-moving strand into one of the wedge-shaped apertures between the spring turns, producing immediate, automatic halting and breaking of the deflected moving strand, and thus avoiding tangled masses of thread tightly jammed on sheaves and drive belts.

3,614,007
YARN-WINDING ASSEMBLY

Ferdinand Lenorak, Bratislava, Czechoslovakia, assignor to Chemicke zavody Julia Dimitrova marodni podnik, Bratislava, Czechoslovakia

Filed Dec. 4, 1968, Ser. No. 780,962
Int. Cl. B65h *75/30, 54/54*
U.S. Cl. 242—46.4 **7 Claims**

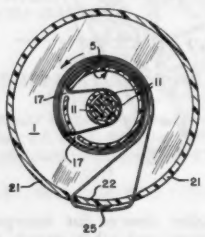


A yarn-winding assembly enabling a cake of wound yarn to be quickly removed from a spool core. The assembly includes an inner shaft and two sets of axially extending spool core components distributed circumferentially about the shaft with the components of one set alternating with the components of the other set. A manually operable means is movable axially of the shaft and coacts with one of the sets of components for displacing this one set inwardly toward the shaft to an inoperative position upon movement in one axial direction and outwardly away from the shaft to an outer operative position upon movement in an opposite axial direction. An elastic means coacts with the other set of components for constantly urging them inwardly toward the shaft to their inoperative positions while the one set of components displaces the other set outwardly to their operative positions in opposition to the elastic means.

3,614,008
CAPSULE REEL ASSEMBLY FOR TAPES

Robert J. Stark, 124 Walnut St., Somerville, Mass.

Filed June 30, 1969, Ser. No. 837,505
Int. Cl. G11b *23/06;* **B65h** *75/02*
U.S. Cl. 242—55.16 **14 Claims**



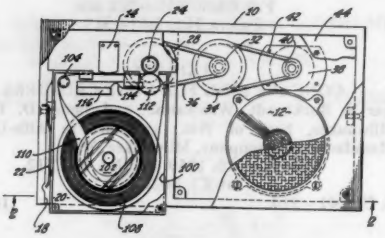
A capsule reel assembly for tapes having a pair of flanges rotatably mounted with respect to each other in spaced-apart parallel relationship, a hub extending between said flanges for supporting a length of tape trained therearound, and a spool disposed about the hub for winding a length of tape into the space between the flanges for storage.

3,614,009
MAGNETIC TAPE CARTRIDGE

Jerry P. Ramult, 715 Encino Drive, Arcadia, Calif.

Filed Feb. 23, 1967, Ser. No. 618,061
Int. Cl. B65h *17/48*
U.S. Cl. 242—55.19 A **6 Claims**

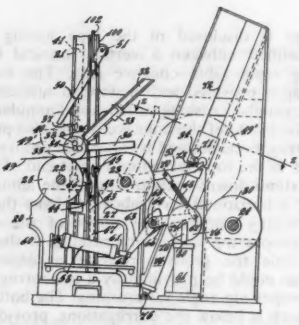
This invention relates to a driving system for magnetic tape which may be used with a magnetic tape cartridge system and wherein the driving system includes a nonrotatable pinch surface in combination with a rotatable capstan to provide for the movement of the magnetic tape. The invention also relates to the use of a relief ledge in a rotatable hub used in an endless coil-type magnetic tape cartridge to reduce friction and flatten the magnetic tape as the magnetic tape emerges from an inside portion of the endless coil of magnetic tape supported by the rotatable hub.



3,614,010
CLOTH WINDER HAVING CUTTER AND PRESSURE BAR

Walter E. Aulen, Woodstown, N.J., assignor to Eddystone Machinery Company, Chester, Pa.

Filed Sept. 3, 1969, Ser. No. 854,986
Int. Cl. B65h *19/20*
U.S. Cl. 242—56 R **11 Claims**



In a cloth winder for sheet material, the cloth is pushed down or engaged from above by a pressure bar or the like at two zones, one forward and one rearward in the direction of progression of the sheet material with respect to the location of the cutter. In one embodiment the cutter has a pusher abutment which engages the fabric opposite a foot on the pressure bar so that the pressure bar initially raises as the cutter raises, and then moves rapidly away from the cutter to permit the new roll to start.

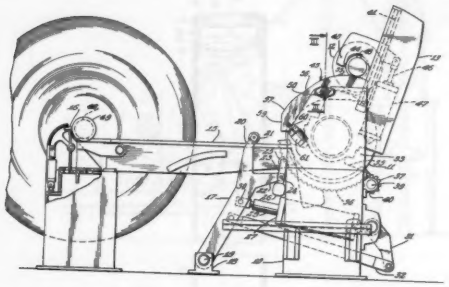
3,614,011
NIP RELIEVING APPARATUS FOR A REEL

Gerald W. Karr, Beloit, Wis., assignor to Beloit Corporation, Beloit, Wis.

Filed Dec. 22, 1969, Ser. No. 886,813
Int. Cl. B65h *75/34*
U.S. Cl. 242—64 **9 Claims**

Apparatus for reeling or winding light grades of paper webs such as tissue. A reed drum having a pair of parallel-spaced horizontal rails extending from the delivery end portion of the reel drum, winds the web onto a spool. Primary transfer arms at each end of the reed drum transfer the spool downwardly along the periphery of the drum onto the rails. The spool is supported at its opposite ends on cam tracks pivoted about axis parallel to the axis of the reel drum. Air cylinders are connected with the cam tracks to position

the cam tracks to hold the spool out of engagement with the periphery of the drum and pivot the tracks to engage the spool with the drum with a preselected minimum nip pressure. The tracks have incoming curvilinear portions formed about one axis and dropping off at their outgoing ends, to lower the partially wound spool onto the rails. The



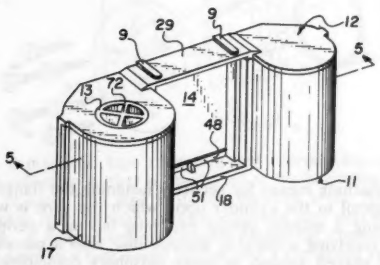
air cylinders cooperate with the outgoing portions of the cam tracks to provide a uniform minimum nip pressure between the spool and reel drum as the spool advances along the outgoing curvilinear portions of the cam tracks. The partially wound spool is delivered from the cam tracks onto the rails, along which the reeling operation is continued under the control of secondary transfer arms.

3,614,012

ELIMINATION OF BACKING PAPER SHORTAGE IN ROLL FILM CARTRIDGES

Robert I. Edelman, Rochester, and Evan A. Edwards, Pittsford, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 6, 1970, Ser. No. 25,864
Int. Cl. G03b *1/04*
U.S. Cl. 242—71.2 **9 Claims**



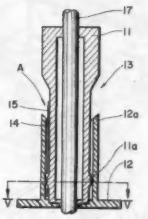
In a double compartment-roll film cartridge loaded with a length of paper-backed film adapted to be wound from a supply roll in a film supply chamber onto a rotatable winding core in a film takeup chamber, the minimum effective diameter of the winding core is at least as large as the maximum diameter of the film supply roll defined by the internal size of the supply chamber. This arrangement avoids the occurrence of film buckling in the exposure gate attributable to the development of more film than paper between the film supply and takeup rolls as a result of the unequal rate at which film and paper are unwound and absorbed by those respective rolls during the film-winding process.

3,614,013

SPOOL FOR WINDING FILMS

Yoshio Kuramoto, Sakai, and Toshio Kobori, Izumichtsu, Osaka, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed July 24, 1969, Ser. No. 844,345
Claims priority, application Japan, Aug. 22, 1968, 43/72370
Int. Cl. B65h *75/28*
U.S. Cl. 242—74 **9 Claims**



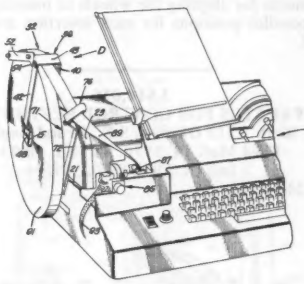
A spool for winding films, having a holding means disposed at a position engageable with perforations of a film, which holding means is both engageable with and disengageable from the perforations when the film moves lateral to the longitudinal centerline thereof, but only engageable with the film when the film moves longitudinally.

3,614,014

TAPE DISPENSING MEANS

William A. Nichols, 5617 Hawthorne, Montclair, Calif., and Ralph E. Simpson, 604 E. Arrow Hwy., Upland, Calif.

Filed Jan. 6, 1970, Ser. No. 855
Int. Cl. B65h *23/10, 19/00*
U.S. Cl. 242—75.2 **10 Claims**

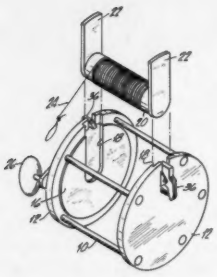


A dispenser for a 14-inch roll of perforator tape with a hollow core. The dispenser has a tape-holding central portion and cooperating tape control and guidance parts. The central tape-holding portion of the dispenser is fastenable to a perforator, and has a backplate to which an outwardly extending axle is affixed. It also has a lightweight metal hub, sized to fit into the hollow core of the tape roll, slidably mounted on the axle. Fixedly secured to the backplate is the first of a pair of arms of a U-shaped roll guard. The two arms of the guard are pivotally joined so that the second is rotatably movable relative to the first. The outer end of the rotatably movable arm has a notch and the outer end of the hub axle a groove, by means of which the arm and axle can be latched together to insure against excessive sidewise slippage of a mounted tape roll along the axle. Pivotally mounted on the U-shaped guard is a swinging arm with a riding roller attached. The riding roller is positioned to ride against the edge of a tape roll mounted on the axle and prevent the unraveling of tape spirals therefrom.

The dispenser is loaded by swinging the rotatably movable arm of the U-shaped guard out of the way, pushing a roll of tape onto the hub, then swinging the rotatably movable arm

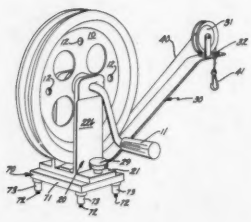
down until the notch in its outer end latches with the groove in the axle.

3,614,015
EASY-LOADING FISHING REEL
Irving Sussman, 540 E. 80th St., Brooklyn, N.Y.
Filed Nov. 10, 1969, Ser. No. 875,299
Int. Cl. A01k *89/00*
U.S. Cl. 242—84.1 R **10 Claims**



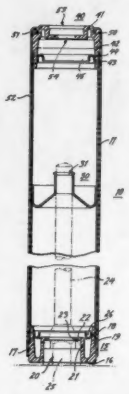
A fishing reel is provided with a detachable spool about which the line is wound and unwound whereby spool and line can be removed and replaced with another spool and line as desired. The fishing reel includes a cylindrical cage provided with a pair of oppositely disposed rotatable parallel-spaced wheels. The wheels are provided with radially extending opposite slots to receive transversely extending flanges provided on opposite ends of the spool to detachably secure the spool to and between the wheels whereby the spool and wheels rotate together to wind and unwind the line. Preferably, catches at opposite ends of the cage hold the flanges in their associated slots. The cage may be provided with elements for aligning the wheels to maintain the slots in aligned parallel positions for easy insertion and removal of the spool.

3,614,016
APPARATUS FOR CONTROL DEPTH FISHING
James E. Rieth, 2315 Okemos, S.E., Grand Rapids, Mich.
Filed Mar. 19, 1970, Ser. No. 20,934
Int. Cl. A01k *89/02, 89/04*
U.S. Cl. 242—106 **17 Claims**



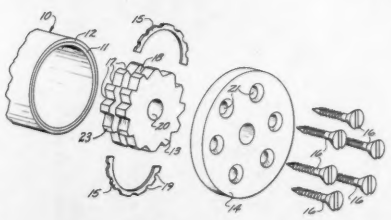
A reel of large diameter and having a handle is mounted on a base. It includes indexing apertures in its side which are arranged in a circular fashion, equidistant from each other on the circle. Line can be wound onto and unwound from the reel. Reel rotation can be stopped by a pin, mounted on the base, which is biased towards engagement with any one of the apertures. A blocking surface is provided on the base which can engage a handle on the pin when the pin is rotated to one position and thereby prevent the pin from engaging an indexing aperture. When the pin is rotated, the handle moves out of engagement with the blocking surface and the pin moves towards the indexing apertures. The base can be secured to a transom-type mounting bracket or to a deck mounting plate.

3,614,017
PIRN
Robert Julien, Verviers, Belgium, assignor to Steel Heddle Manufacturing Company, Philadelphia, Pa.
Filed Oct. 15, 1969, Ser. No. 866,578
Int. Cl. B65h *75/10*
U.S. Cl. 242—118.3 **5 Claims**



A pirn is provided having a central tubular portion and an end cap which is retained in the tubular portion by an annular interior ferrule in engagement with a flange of the end cap. The pirn may also be provided with a central bearing and an additional end cap.

3,614,018
TEXTILE SPOOL
James Elmo Jones, P.O. Box 6627, Greensboro, N.C.
Filed Dec. 29, 1969, Ser. No. 888,775
Int. Cl. B65h *75/14*
U.S. Cl. 242—118.61 **5 Claims**

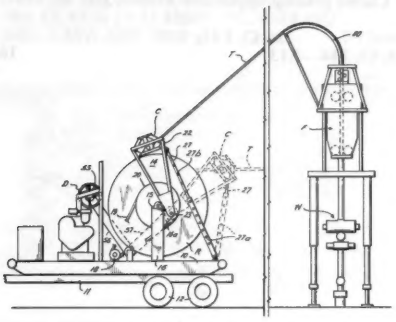


An attaching means for securely fastening the flange of a textile spool to the cylinder upon which the yarn is wound comprising a molded plastic end plug having a peripheral groove receiving a metallic annular disc with a plurality of notches spaced around its outer periphery coinciding with cooperating notches in the periphery of the plug itself. The plastic plug is inserted into the end of the cylinder and the flange attached by screws, whereupon the disc urges the screws into threading engagement with the inner wall of the cylinder, thereby securely locking the flanges onto the spool.

3,614,019
APPARATUS FOR CONTROLLING THE WRAPPING OF TUBING ONTO A REEL
Damon T. Slator, and Archie Wilson, both of Houston, Tex., assignors to Bowen Tools, Inc.
Filed May 13, 1970, Ser. No. 36,780
Int. Cl. B65h *57/28*
U.S. Cl. 242—157.1 **10 Claims**

Apparatus for controlling the wrapping of tubing onto a reel to obtain substantially uniform- and level-wrapped layers

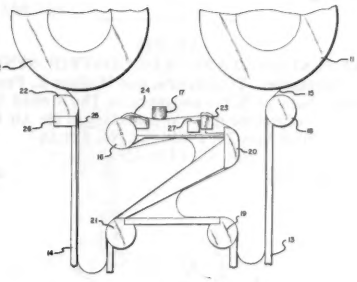
on the reel, wherein the wrapping is normally accomplished by a free-wheeling or substantially unrestrained feeding of the tubing, but wherein control means is provided to force the tubing to feed in a desired manner to avoid improper wrapping of the tubing onto the reel.



3,614,020
TAPE REWIND SPEED CHANGE SYSTEM

Zoltan L. Herger, Northglenn, Colo., assignor to Storage Technology Corporation, Boulder, Colo.

Filed Apr. 27, 1970, Ser. No. 32,120
Int. Cl. B65h *59/38;* **G03b** *1/04;* **G11b** *15/06*
U.S. Cl. 242—188 **4 Claims**



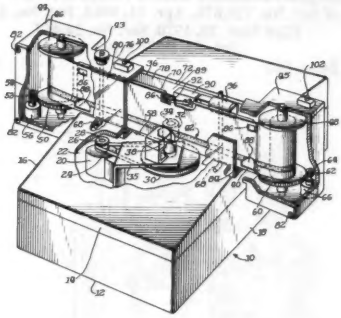
In a magnetic tape recording and reproducing system a light-reflective marker is positioned at the beginning of each reel of tape. The tape is driven between a file reel and a machine reel, through vacuum columns, and past magnetic heads. A control system includes means for controlling the tape drive in a high-speed rewind and a low-speed rewind. A sensor is positioned at the opening of the vacuum column on the machine reel side of the magnetic heads. This sensor produces an output upon passage of the reflective marker. The output is connected to the control system to switch in from a high-speed rewind to a low-speed rewind upon passage of the marker. In this manner a significant decrease in rewind time is obtained.

3,614,021
RECORD-HANDLING DEVICE

Richard M. Davidson, Northbrook, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Nov. 29, 1968, Ser. No. 780,096
Int. Cl. B65h *25/00, 25/32;* **G03b** *1/42*
U.S. Cl. 242—188 **13 Claims**

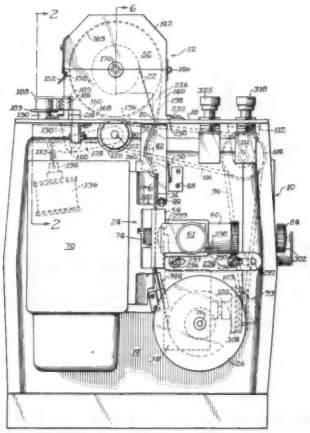
An accessory enables a device with a drive for moving successive record cards past a transducer, to advance adjoining record frames on a web past the transducer. Means in the accessory, in response to frame-defining means in the web, open an electrical circuit to stop the web frame by frame and enable manual reinitiation of web movement.



3,614,022
PROJECTOR FOR AUTOMATICALLY THREADING, REWINDING, AND INDEXING A PLURALITY OF FILM SPOOLS AND A MAGAZINE

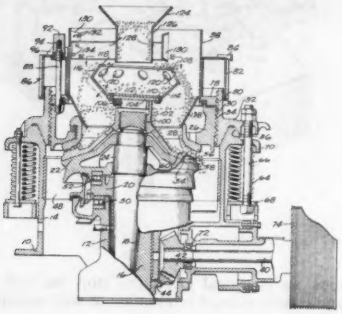
Elmer C. Henriksen, Chicago, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Continuation of application Ser. No. 439,210, Mar. 12, 1965, now abandoned. This application Feb. 19, 1968, Ser. No. 706,239
Int. Cl. G03b *1/04;* **G11b** *15/32, 23/04*
U.S. Cl. 242—198 **16 Claims**



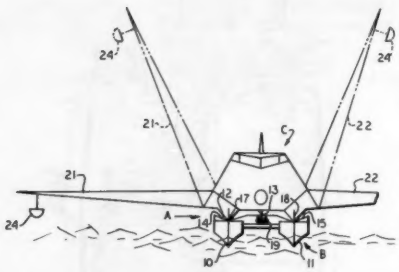
A magazine having a plurality of adjoining reel compartments supplies film from successive reels in a film path for forward projection and receives film returned from the path during reverse projection and rewind following forward projection according to the condition of means for moving film between the magazine and a takeup member. During projector threading and rewind, the film path is enlarged and a shuttle for moving film intermittently during projection is prevented from film engagement. Sensing means at the film path condition the projector for (1) forward projection following threading, (2) rewinding following forward projection, and (3) terminating rewinding.

3,614,023
GYRATORY CRUSHER
Fred Curtis Archer, Whitefish Bay; Ronald B. DeDiemar, Brown Deer, and LeRoy J. Schuman, Milwaukee, all of Wis., assignors to Barber-Greene Company, Aurora, Del.
Division of Ser. No. 720,676, Apr. 11, 1968, Pat. No. 3,533,568.
Filed Mar. 30, 1970, Ser. No. 24,467
Int. Cl. B02c 2/04
U.S. Cl. 241—202 9 Claims



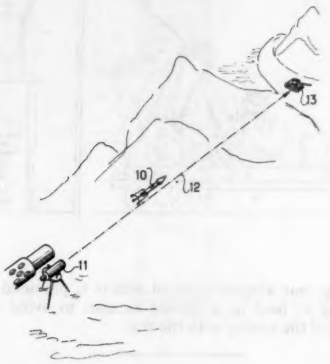
A gyratory or cone-type crusher embodying an improved feed distributor for supplying material to be processed uniformly to the crushing chamber or zone.

3,614,024
COMBINED WATER SURFACE AND AIR CRAFT
Victor Millman, San Diego, Calif., assignor to Rohr Corporation, Chula Vista, Calif.
Filed Apr. 6, 1970, Ser. No. 25,776
Int. Cl. B64d 3/00
U.S. Cl. 244—2 7 Claims



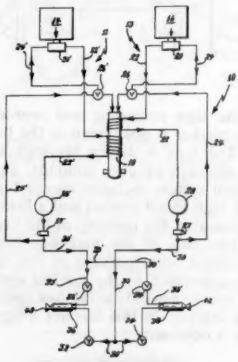
A motorless aircraft carrying a pilot, and, if desired, one or more passengers, is mounted on a high-speed water surface craft having servocontrolled propulsion and steering mechanism. Each of one or more power winches in the surface craft controls the reeling out and in of a towing cable and, optionally, electrical conductors. Electrical pilot controlled means in the aircraft are operatively connected to electrically responsive individual servo means controlling the propulsion, steering and winch means in the surface craft, so that a pilot in the aircraft can maneuver the surface craft with the aircraft mounted thereon on the surface of the water, and can take off from the water craft at a determined minimum air speed upon unreeling the tow cable. He then flies the aircraft in the manner of a towed glider, while still maintaining full operational control of both the surface and air craft.

3,614,025
MACHINE GUIDING SYSTEM
Henry Maillet, Sceaux, France, assignor to Compagnie Generale D'Electricite, Paris, France
Filed July 17, 1968, Ser. No. 745,644
Claims priority, application France, July 19, 1967, 114 851
Int. Cl. F41g 9/00, 7/00, 7/14
U.S. Cl. 244—3.13 16 Claims



Determining the instantaneous position of a rotating machine moving at high speed along a trajectory path by impinging a fine light beam of generally flat form which rotates about an axis parallel to the direction of light propagation onto a plurality of detectors carried by the rotating machine in a plane perpendicular to the trajectory axis and measuring the time intervals separating the generated signals.

3,614,026
SELF-SUSTAINED ATTITUDE CONTROL SYSTEM
Louis N. Montanino, Tonawanda, and William E. Pearson, E. Amherst, both of N.Y., assignors to The United States of America as represented by the Secretary of the Air Force
Filed Apr. 29, 1969, Ser. No. 821,167
Int. Cl. F42b 15/18
U.S. Cl. 244—3.22 4 Claims



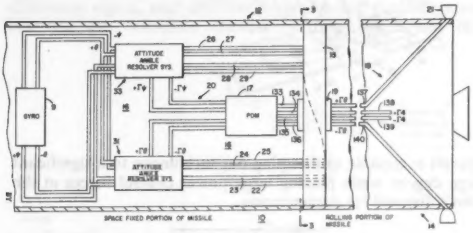
A self-sustained attitude control system having a propellant tank, a pump, a heat source and an accumulator. The accumulator stores the superheated vapors expelled from the heat exchanger after being pumped therethrough. The superheated vapors released from said accumulator are used for (1) attitude control, (2) actuation of the pump, and (3) as the heat source in the heat exchanger.

3,614,027

PNEUMATIC RESOLVER FOR MISSILE CONTROL

Charles Lynn Lewis, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army

Filed July 8, 1969, Ser. No. 839,829
Int. Cl. F42b *15/02*; G06f *1/00*; F15d *1/02*
U.S. Cl. 244—3.22 9 Claims



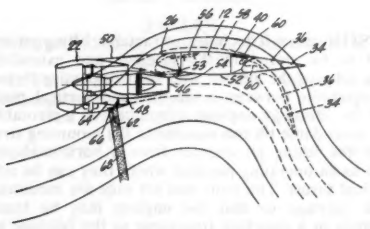
A pneumatic attitude control system for an artillery-type missile which is spin stabilized during flight. The control system includes a sensor portion which is roll stabilized and, thus, will not roll with the missile. Thus, attitude angles measured by the roll stabilized sensors will be space fixed. Control valves for providing restoring torques on the missile are mounted on the rotating part of the missile for rotation therewith. A resolution system is provided for resolving the space-fixed signals from the roll-stabilized sensors into the rolling missile's coordinate system for desired operation of the control valves.

3,614,028

TURBOFAN-POWERED STOL AIRCRAFT

Harold F. Kleckner, Pacific Palisades, Calif., assignor to McDonnell Douglas Corporation

Filed Jan. 12, 1970, Ser. No. 2,109
Int. Cl. B64d *27/18*
U.S. Cl. 244—15 11 Claims



A short takeoff and landing (STOL) aircraft employing turbofan engines and a wing and flap arrangement to provide propulsive lift, a high lift capability, and a steeper landing approach flight path. Improvements in these characteristics are achieved by a particular positioning of the engine fan and primary exhaust efflux flow relative to the wing and by locating the flaps for operation in consort with the engine-derived gaseous flow and the wing.

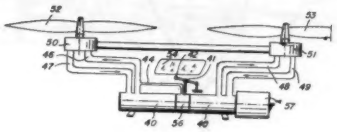
3,614,029

ADDED FLUIDFLOW CONTROL MEANS FOR GOVERNING THE ATTITUDE OF FLUIDBORNE VEHICLES

Karl Eickmann, 2420 Isshiki, Hayama-machi, Kanagawa-ken, Japan

Continuation of application Ser. No. 770,912, Oct. 28, 1968, Continuation-in-part of application Ser. No. 552,608, May 24, 1966, now abandoned, Continuation of application Ser. No. 328,395, Dec. 5, 1963, now Patent No. 3,320,898, dated May 23, 1967. This application June 12, 1970, Ser. No. 48,863
Int. Cl. B64c *27/08*
U.S. Cl. 244—17.23 11 Claims

A fluidborne vehicle, such as an aircraft, has two propellers positioned symmetrically on either side of a longitudinal centerline of the vehicle, or has two pairs of propellers, with the pairs positioned symmetrically on opposite sides of the longitudinal centerline. The propellers are driven by respective hydraulic motors and each motor is connected by supply and return flow lines to a source of hydraulic fluid under pressure and independently of each other hydraulic motor, the hydraulic flows to all of the motors being equal or in a fixed proportion to each other. An additional source of hydraulic fluid under pressure has control means for selectively augmenting or decreasing the flow to a selected hydraulic motor.

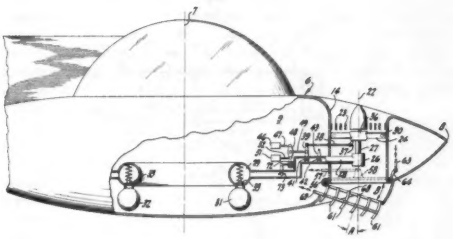


3,614,030

AIRCRAFT

Paul S. Moller, 1308 "B" St., Davis, Calif

Filed Dec. 10, 1969, Ser. No. 883,980
Int. Cl. B64c *29/04*
U.S. Cl. 244—23 C 3 Claims



A disclike aircraft body is substantially a figure of revolution about a main axis and has a plurality of air ducts extending through the body in a direction parallel to said axis, the ducts being arranged in arcuate series except in the foremost and rearmost positions. Each of the ducts has individually controlled means for inducing airflow downwardly therethrough such as a fan rotating on an airflow axis parallel to the main axis or a thrust augmentor supplied with pressure gas from a common source. Downstream of the inducing means is an individually controlled rotary member movable about the airflow axis and having deflectors movable about transverse axes to govern the discharge of air from the ducts.

3,614,031

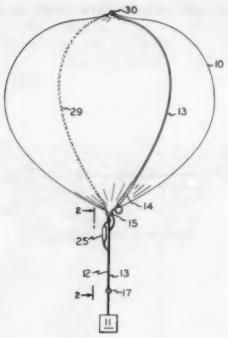
BALLOON DESTRUCT DESCENT AND RECOVERY SYSTEM

Henry Demboski, 5302 N. Washington Blvd., Arlington, Va.

Filed Apr. 9, 1970, Ser. No. 27,095
Int. Cl. B64b *1/48*
U.S. Cl. 244—32 7 Claims

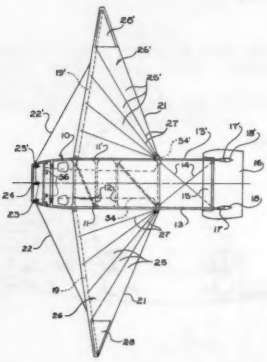
A structure for recovering the instrument package of a high-altitude balloon by providing means for destroying a

portion of the balloon, inverting the balloon and allowing the escaping gas to provide a controlled descent until such time



as the balloon is deflated and a parachute then provides a means for returning the entire package to the earth.

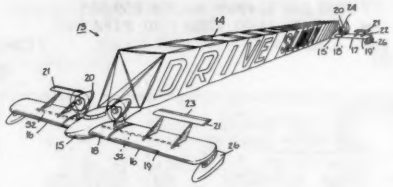
3,614,032
AIRCRAFT
Thomas H. Purcell, Jr., 2709 Everett Ave., Raleigh, N.C.
Filed Apr. 28, 1969, Ser. No. 819,749
Int. Cl. B64c *1/00*
U.S. Cl. 244—36 **10 Claims**



In abstract, a preferred embodiment of this invention is an aircraft design capable of being built by amateurs in stages as time and money become available while at the same time being readily adaptable for assembly line production. This aircraft uses a new concept of designing the upper portion of the fuselage to conform to the shape of the plane formed at the junction of two intersecting cylinders disposed angularly to each other. This fuselage shape in combination with a minimum flotation system gives an extremely stable aircraft on both water, land and in the air which has a tremendous load carrying capacity for the size power plant required.

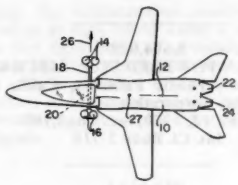
3,614,033
TANDEM WING AIRCRAFT WITH FREELY PITCHING WING SURFACES
Lewis C. McCarty, Jr., Thornton-le-Dale, England, assignor to Central Aircraft Manufacturing Company, Inc., Washington, D.C.
Filed June 14, 1968, Ser. No. 737,046
Int. Cl. B64c *3/38, 3/08*
U.S. Cl. 244—48 **24 Claims**

The lifting surfaces of the wings are freely pivotal to maintain a stable trim and are provided with pilot-actuated flaps for controlling the attitude of the lifting surfaces. The wings are arranged in tandem at the front and rear of the aircraft and enables the fuselage to be of great length. The



aircraft is capable of damping out turbulence to a significant large degree while placing large power control forces at the pilot's disposal for maneuvering.

3,614,034
V/STOL AIRCRAFT
Richard E. Townsend, Huntington, Long Island, N.Y., assignor to Fairchild Hiller Corporation, Farmingdale, L. I., N.Y.
Filed July 9, 1969, Ser. No. 840,202
Int. Cl. B64d *27/20*
U.S. Cl. 244—56 **8 Claims**

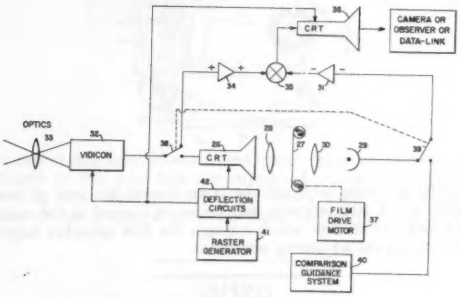


A V/STOL aircraft includes retractable lifting jet engines adapted to be stored in the fuselage and extendable to opposite sides of the aircraft with their respective thrust axes being adjustable between horizontal and vertical positions. Each of the lifting jet engines is mounted on a pivotable arm with an extendable tilt rod secured to the mounting structure to pivot the lifting jet engines from a horizontal stowage position to an operating position where they can be adjusted for vertical thrust. The arms and tilt rods are mounted on a movable carriage so that the engines may be translated horizontally in a direction transverse to the fuselage axis to provide roll control. By pivoting the engines on the mounting arms, variable-pitch control may be provided. The lifting jet engines are also mounted for rotation relative to their associated arms about axes generally parallel to the fuselage axis, with means for simultaneously rotating the lifting jet engines about these axes to provide yaw control.

3,614,035
CHANGE DETECTOR
George R. Buynak, Cuyahoga Falls; Nicholas D. Diamantides, Cuyahoga Falls, and Richard H. Smith, North Canton, all of Ohio, assignors to Goodyear Aerospace Corporation, Akron, Ohio
Filed Feb. 10, 1964, Ser. No. 343,675
Int. Cl. B64c *13/50*
U.S. Cl. 244—77 **2 Claims**

1. In a target change detector adapted for combination with a reconnaissance aircraft, the combination of a reference transparent scene film, a film drive means, a cathode-ray tube adapted to scan the total area of the transparent film with nominal raster technique, a photomultiplier adapted to receive the scanning beam of the cathode-ray tube through the transparent film, lens means to properly direct the scanning beam of the cathode-ray tube to the transparent film and to the photomultiplier to produce

video signals, a vidicon adapted to electronically image a comparison scene of the earth beneath the aircraft and produce video signals, a pair of wide-band electronic amplifiers adapted to receive the video signals from the vidicon and the photomultiplier respectively, the amplifier for the vidicon being set for a positive output signal, the amplifier for the photomultiplier being set for a negative output signal, a summer unit adapted to receive the video signals of opposite polarity from the amplifiers to produce a difference signal, said difference signal being the difference between the reference transparent film signal and the



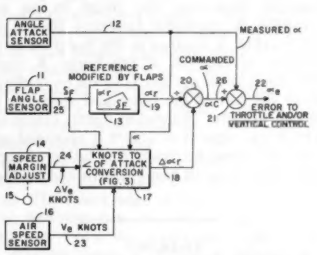
comparison vidicon signal, a comparison guidance system section adapted to compare the vidicon image with the film image to keep the aircraft flying on the proper course, switch means between the vidicon and its amplifier, said switch adapted to switch the vidicon signal to the cathode-ray tube input, switch means between the photomultiplier and its amplifier, said second-mentioned switch adapted to shift the photomultiplier signal to the comparison guidance system and means to change the switches synchronously together to change the apparatus from the change detector section to the comparison guidance system.

3,614,036

CONVERSION PRINCIPLE-ANGLE OF ATTACK TO AIRSPEED

Jimmie L. Foster, Granada Hills, Calif., assignor to Collins Radio Company, Cedar Rapids, Iowa

Filed Oct. 13, 1969, Ser. No. 865,842
Int. Cl. B64c *13/18*
U.S. Cl. 244—77 D **6 Claims**



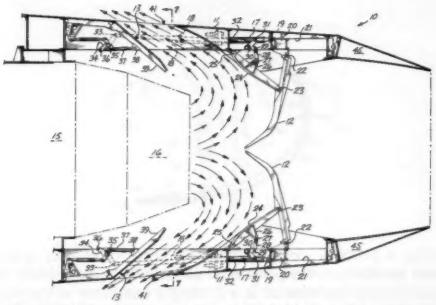
A conversion principle and implementation means for permitting linear airspeed input increments to be introduced into an angle of attack referenced control system for an aircraft by means of which the normal margin over stall speed controlled by the system, such as $1.3V_s$, may be increased by a desired incremental airspeed ΔV. The selected incremental airspeed ΔV is converted to an equivalent incremental angle of attack parameter which is added to the reference angle of attack parameter normally used in the system control computations.

3,614,037

AIRCRAFT COMBINATION THRUST REVERSER AND SOUND SUPPRESSOR AND A PARTICULAR FULL RANGE BALANCED THRUST REVERSER

Alexander V. Vdolek, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Sept. 22, 1969, Ser. No. 859,937
Int. Cl. B64d *33/04*
U.S. Cl. 244—110 B **4 Claims**



A new thrust reverser is so shaped that sound suppressor chutes may be positioned between the thrust reverser doors and within the fore and aft limits of the thrust reverser doors to form a compact, efficient combination thrust reverser and sound suppressor. A modulating thrust reverser, the elements of which being supported at their centroids for effortless movement to all positions between retracted position for providing zero reverse thrust from a reaction engine exhaust to fully extended position for generating maximum reverse thrust for use as (1) a modulating thrust reverser as a braking device on the ground subsequent to landing or prior to an aborted takeoff, (2) a modulating thrust reverser for inflight reversing for rapid descent, and (3) a thrust-modulating device for rapid thrust adjustments as may be required during a landing approach. The balanced doors require only a small actuating force for movement thereof, and for holding thereof in the end positions or any position intermediate thereof, independent of the thrust setting of the engine. Likewise, noise attenuation of the jet exhaust results from the intermediately positioned thrust reverser doors, during thrust modulation during landing approach.

Tertiary doors which are located on the outer surface of a secondary nozzle provide aerodynamically smooth air ducts for supplying ambient cooling air and for improving the efficiency of the secondary nozzle during takeoff and through subsonic flight. Further, tertiary doors comprising fore and aft portions covering the air ducts adjacent the engine air intake, are connected to the thrust reverser doors for opening only the aft portion of the tertiary door to accordingly eject away from the aircraft to prevent attachment of the hot exhaust gases to the nacelle skin and the accompanying scorching and sooting thereof and to prevent reingestion of the exhaust gases into the engine air intake. Some of the tertiary doors are further responsive to the thrust reverser doors for being held closed during reverse thrust to adjust the exit area for proper engine area matching. Some doors are closed to prevent impingement of the exhaust gases against adjacent aircraft surfaces. The shape of the new thrust reverser doors provides adequate room for the positioning of sound suppressor chutes between the thrust reverser doors to accordingly form a compact and efficient combination thrust reverser and sound suppressor unit.

3,614,038

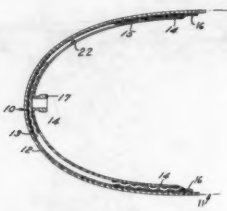
POROUS METAL PANEL TO DISTRIBUTE DEICING FLUID ONTO THE LEADING EDGE OF A SURFACE

Gerald L. Nichols, Farmington, Mich., assignor to Ace Filtercraft, Inc., Farmington, Mich.

Filed Jan. 8, 1970, Ser. No. 1,421
Int. Cl. B64d *15/08*
U.S. Cl. 244—134 C **7 Claims**

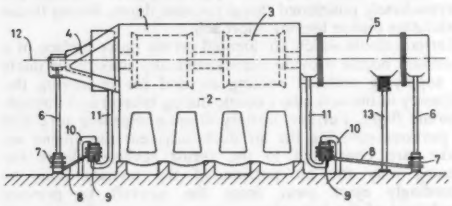
A porous metal panel for use in distributing deicing fluid onto the leading edge of a surface, such as the wings and tail

of an airplane or other vehicle, that requires protection against ice. The porous metal panel includes a porous outer metal plate, a nonporous inner metal plate, a porous metal membrane having a porosity finer than the porosity of said porous outer plate disposed on the inner surface of said porous outer plate, a separator member comprising a sheet of metal wire mesh disposed between said metal membrane and said inner nonporous metal plate, said separator member



having a porosity coarser than the porosity of said porous metal membrane, the peripheral edges of said inner plate and membrane being bonded in a fluidtight condition to the outer plate to enclose said separator member and form a fluid chamber, and means for connecting said fluid chamber to a source of pressurized deicing fluid for admission of said fluid into said chamber for distribution through said membrane and outer porous plate onto said surface.

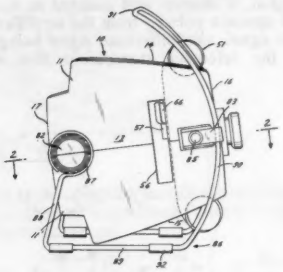
3,614,039
DEVICE FOR AUTOMATICALLY ADJUSTING THE EFFECTIVE LENGTH OF A STAY OR SUPPORT
Lars Arvid Norberg, Finspong, Sweden, assignor to Stal-Laval Turbin Aktiebolag, Finspong, Sweden
Filed Apr. 30, 1969, Ser. No. 820,458
Claims priority, application Sweden, May 7, 1968, 6108/1968
Int. Cl. F16c *35/00*
U.S. Cl. 248—2 **1 Claim**



A device for automatically adjusting the effective length of a stay or supporting post such as is used for the support of parts of or associated with a steam turbine, the stay being connected at one end to the turbine or other part and connected at its other end to an oil-containing compensator. The said compensator communicates with a second similar compensator, the latter compensator being connected at its lower end to a strut that extends to and attaches to the turbine or other element thereof to which the first compensator is attached.

3,614,040
STAND FOR PROJECTOR
Eugene Martinez, Irvington-On-Hudson, N.Y., assignor to Robert H. Reibel, Croton-On-Hudson, N.Y., a part interest
Division of Ser. No. 715,621, Mar. 25, 1968, Pat. No. 3,522,943.
Filed Feb. 11, 1970, Ser. No. 10,345
Int. Cl. F16m *13/00*
U.S. Cl. 248—11 **10 Claims**

A projector having a molded plastic outer case which is supported by a curved steel stand which also serves as an elevating device and carrying handle. The projector can be tilted simply by sliding it up on the curved stand and locking it with two knobs. An electric lamp is mounted at a center location within the case and a pair of heat dissipating baffle plates are positioned on opposite sides of the lamp. A cover is positioned over the lamp and baffle plates to direct the



cooling air rising adjacent the lamp toward the rear of the projector. A film advance mechanism is housed in the case and includes an arm which engages the film sprocket holes only during the advancing operation.

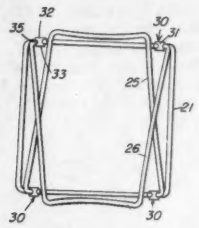
3,614,041
TRASH BAG HOLDER
Everett L. Koger, 9331 Glendon Way, Rosemead, Calif.
Filed Nov. 10, 1969, Ser. No. 875,038
Int. Cl. B65b *67/12*
U.S. Cl. 248—97 **7 Claims**

A holder for trash bags and the like comprising a hoop with an elongated circumferential channel in its rim and a support structure mounting the hoop in an essentially horizontal position. A releasable fastening device, preferably a spring loaded cable, is secured to the hoop for engagement with the channel in the rim of the hoop. A trash bag is secured to the hoop in an upright position by folding its open end down over the rim of the hoop and engaging the cable with the rim and its outer channel to tightly clamp the bag to the hoop. The hoop support structure is arranged so that the trash bag can be removed from the holder laterally with respect to the hoop without being obstructed by the support structure.

3,614,042
FOLDABLE FRAME STRUCTURE FOR COMBINATION WITH A LIMP BAG OF PLASTIC MATERIAL TO RETAIN THE BAG IN EXTENDED POSITION ABOVE A SUPPORT SURFACE
David R. Jensen, Pittsford, N.Y., assignor to Mobil Oil Corporation
Filed Jan. 2, 1970, Ser. No. 1
Int. Cl. B65b *67/12*
U.S. Cl. 248—97 **5 Claims**

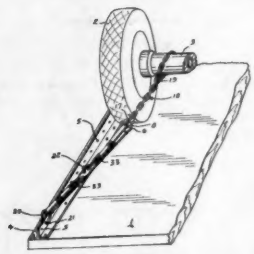
A closed rim, for example a squared-off ring of stiff wire material has four clips formed thereon, essentially of U-shape leaving a space the width of the wire rim therebetween; a pair of U-shaped leg structures are resiliently snapped into

the clips, the legs being held in extended position by the U-shaped clips and having angled-off ends fitting between the clips to bear against the rim; upon resiliently spreading the legs, they can be slid out from between the U-shaped clips, the ends remaining therein and the legs folded over to form a



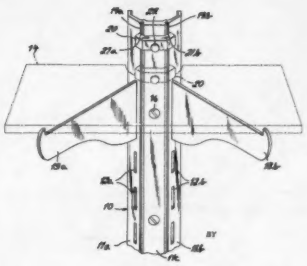
compact structure; when erected, plastic bags longer than the length of the wire legs are supported around the rim by having their open mouth folded down over the rim, the bottom being supported on the same surface supporting the legs.

3,614,043
RESTRAINING DEVICE FOR AIR DROP LOADS
Michael H. Reagan, Dayton, Ohio
Filed Nov. 5, 1969, Ser. No. 874,194
Int. Cl. B60p *7/06*
U.S. Cl. 248—119 R **1 Claim**



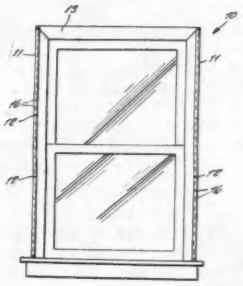
The disclosure relates to tiedowns for securing loads to a platform which can be carried on moving vehicles or dropped from a plane by parachute. These platforms, usually made of wood, are reinforced at their edges by lengths of angle iron or rails having openings along the upper leg for receiving the tiedowns. Strips of woven plastic webbing are used as the tiedown elements on account of its tensile strength and ability to yield under stress. The tiedown webbing is threaded through the eye of a clevis, the bolt of which passes through one of the openings in the longitudinally extending rail of the platform. At the load end, the webbing is received by a slot in an improved adaptor or webbing link. The lower edge of the slot has a curved shape so that the webbing can be looped around this surface without abrasion. From this point, the webbing is returned toward its starting point to form, in effect, two parallel lengths of the webbing with the clevis at one end of the double length and the adaptor at the other end. A belt tightener of standard design is inserted in one of these lengths. Each end of the webbing length, where the tightener is employed, is provided with a metal loop attachment sewn into the webbing material for detachably receiving the oppositely disposed hooks of the belt tightener. The adaptor has an opening therein for receiving the closed end link of a grab chain terminating in a load attachment hook which can be attached to one of the binding straps encircling the load or attached to a mechanical part of the load in any suitable manner.

3,614,044
SHELF MOUNTING WITH LOCKING SLIDER
Martin Bard, 4318 8th Ave., Brooklyn, N.Y.
Filed Mar. 31, 1970, Ser. No. 24,230
Int. Cl. A47g *29/02*
U.S. Cl. 248—243 **7 Claims**



A standard with mounting slits for shelf-supporting arms has two relatively inclined longitudinal faces formed with a pair of vertical grooves for the guidance of a slider adapted to be locked in position, against an intervening third face, to hold down an edge of a shelf carried by a pair of divergent arms.

3,614,045
SNAP-IN DRAPERY BRACKETS
Rudolph J. Cegielski, Jr., 7426 Random Ridge Drive, Tucson, Ariz.
Filed Jan. 21, 1969, Ser. No. 792,519
Int. Cl. A47h *1/10*
U.S. Cl. 248—262 **1 Claim**

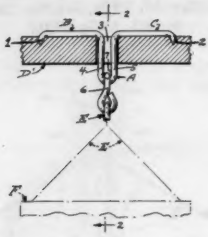


An improved support means for drapery at a window, the device comprising a pair of vertical aluminum channels secured along opposite sides of a window sash frame, each aluminum channel being provided with a plurality of vertically spaced-apart slot scores which may be selectively punched out so as to receive a drapery rod bracket, thereby eliminating the necessity of securing the drapery rod bracket directly to the window frame.

3,614,046
HANGER FOR SUPPORTING LIGHT FIXTURES, ETC.
Melvin T. Lehman, 565 Grove Way, Hayward, Calif.
Filed Nov. 12, 1969, Ser. No. 875,690
Int. Cl. E04g *17/18;* **E04b** *5/52*
U.S. Cl. 248—343 **3 Claims**

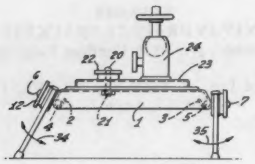
A hanger for supporting light fixtures, electrical conduit, etc., that consists of a single member provided with pointed ends which may be driven into a supporting member, such as plywood, and which has a central depending U-shaped portion for supporting a jack chain. In one form of the bracket the depending U-shaped portion extends through an

opening in the plywood and in a modified form the U-shaped



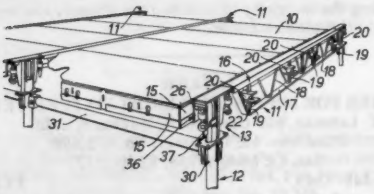
portion registers with the plywood opening while the jack chain extends through the opening.

3,614,047
STAND FOR CAMERAS, MICROPHONES OR THE LIKE
Werner Hitze, Am Puttenser Felde 2, 3 Hannover, Germany
Filed Jan. 23, 1969, Ser. No. 793,297
Claims priority, application Germany, Feb. 1, 1968, P 16 73 912.1
Int. Cl. F16m *11/38*
U.S. Cl. 248—439 **18 Claims**



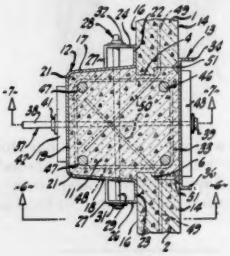
A stand for mounting objects such as cameras or the like is disclosed in which a base element has two pairs of legs which are mounted at opposite sides of the base element for pivoting the legs of a pair in unison, as well as individually, and for folding them under the base plate. An auxiliary support for the object holder proper is mounted on the base element for angular and radial adjustment (in a horizontal plane) of the center of gravity.

3,614,048
ARRANGEMENTS FOR USE IN THE SUPPORTING OF FORMWORK FOR THE CASTING OF CONCRETE SLABS
George B. A. Young, Wheaton Aston, England, assignor to Rapid Metal Development Limited, Aldridge, Walsall, Staffordshire, England
Filed Nov. 6, 1968, Ser. No. 773,821
Claims priority, application Great Britain, Nov. 7, 1967, Feb. 26, 1968, 50567/67; 9135/68
Int. Cl. E04g *11/52*
U.S. Cl. 249—18 **8 Claims**



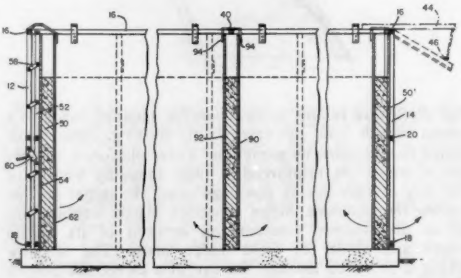
A concrete slab-casting system includes props with heads beams extending between the heads and panels resting on elements slidable vertically on the beams. The elements can be locked in raised positions for the casting operation and lowered for removal of the panels one at a time. The joints between the beams and the heads permits removal of the beams without lowering the heads.

3,614,049
COMBINED BUILDING WALLS PANELS AND ASSOCIATED FORM STRUCTURE
David H. Keyston, Burlingame, Calif., assignor to Anza Pacific Corporation, Burlingame, Calif.
Division of Ser. No. 662,265, Aug. 8, 1967, Pat. No. 3,547,395.
Filed June 26, 1969, Ser. No. 871,382
Int. Cl. E04g *11/00, 13/02*
U.S. Cl. 249—19 **2 Claims**



A reusable building form structure defined by two rigid, preformed, self-supporting unitary form members, used in combination with a pair of building wall panels to bridge a space therebetween so that a settable construction material introduced into such space may be held in place while setting. At least one form member is channel shaped having tapered walls to facilitate its separation from the column formed by the settable construction material.

3,614,050
REUSABLE FORMING UNIT
William Greenhalgh, P.O. Box 521, Oshawa, Ontario, Canada
Filed Oct. 7, 1969, Ser. No. 864,461
Int. Cl. E04g *11/02*
U.S. Cl. 249—26 **5 Claims**

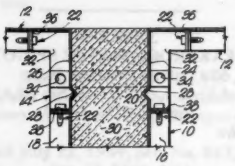


Reusable forming unit for pouring enclosed wall structures in situ including a movable frame supporting inner and outer wall panels. One wall section is pivotally mounted for vertical swinging movement, the remainder of the sections including pivotally mounted inner wall forming panels and positioning means for effecting a selective outward and upward movement of the outer wall forming panels.

3,614,051
LEDGER FORM FOR CONCRETE STRUCTURES
James E. Trimmer, Kansas City, Mo., assignor to Precise Forms, Inc., Kansas City, Mo.
Filed Dec. 15, 1969, Ser. No. 885,251
Int. Cl. E04g *11/02*
U.S. Cl. 249—27 **7 Claims**

An intermediate form section interconnects the vertical and horizontal form sections of a concrete wall and ceiling

form, and concrete-engaging ledger means on the intermediate section allows the latter to support the horizontal section when the vertical wall section has been removed. The intermediate section is also provided with horizontal and vertical segments which abut the horizontal and vertical sections respectively, and also has inner and



outer elements disposed in spaced interconnected relationship to constitute a form for that portion of the concrete wall which is contiguous with the ceiling. Ledger means on each of the elements are disposed in opposed planer relationship to assure maximum distribution of the weight of the horizontal section.

3,614,052

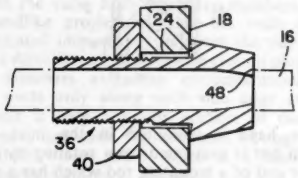
TIE ROD SEAL FOR PREFABRICATED WALL FORMS

William C. Babbage, Gross Pointe Woods, Mich., assignor to Rocform Corporation, Southfield, Mich.

Filed Jan. 31, 1969, Ser. No. 795,478

Int. Cl. E04g *17/06*

U.S. Cl. 249—43 **4 Claims**



A tubular sealing member for sealing the hole in a wall panel through which a tie rod extends to connect the panel to a second panel of a form for composition walls. The tubular member has an enlarged head for sealing the panel around the hole, and may have an internal formation for sealed engagement with the rod. The head may be so shaped as to produce any desired architectural detail in the surface of the composite wall.

3,614,053

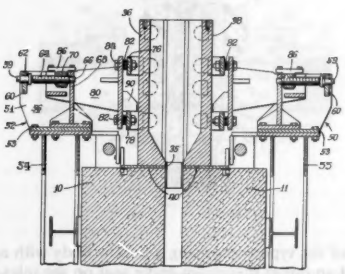
RISER CONSTRUCTION FOR CASTING APPARATUS

Richard O. Peck, Elk Grove Village, Ill., assignor to AMSTED Industries Incorporated, Chicago, Ill.

Filed Oct. 10, 1969, Ser. No. 865,459

Int. Cl. B29c *9/08*

U.S. Cl. 249—105 **3 Claims**



A riser assembly for use with a mold having a pair of separable parts includes a pair of sections that are resiliently and pivotally mounted on the respective mold parts. As the mold parts are moved together to define a casting cavity, the riser parts simultaneously define a riser cavity and are urged into sealing engagement with the mold parts.

3,614,054

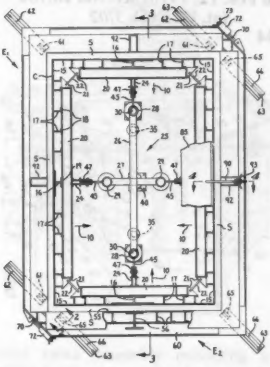
FORM FOR PORTABLE CONCRETE BUILDING MODULE

Robert W. Beasly, Newberg, Oreg., assignor to Ted Nelson Company, Portland, Oreg.

Filed Dec. 5, 1968, Ser. No. 781,554

Int. Cl. B28b *7/30*

U.S. Cl. 249—179 **3 Claims**



The form is used for casting wall portions of a single rectangular room as a modulator unit to be assembled with other such units and floor and ceiling structure to build homes, apartment houses and other buildings. The form comprises a core form and two exterior forms. The core form is contractable in all directions for stripping. The two exterior forms are L-shaped, each embracing one end wall and one sidewall of the room, these forms being supported by trolleys on diagonal tracks for movement away from each other in stripping.

3,614,055

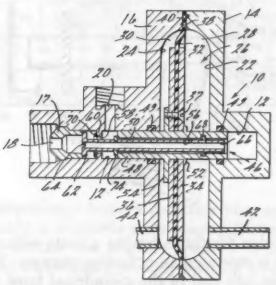
PRESSURE-REGULATING VALVE

Joseph W. Douglas, Chelsea, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Continuation-in-part of application Ser. No. 677,442, Oct. 23, 1967, now abandoned. This application Oct. 1, 1969, Ser. No. 864,289

Int. Cl. B60t *8/12*; **F16k** *31/145*

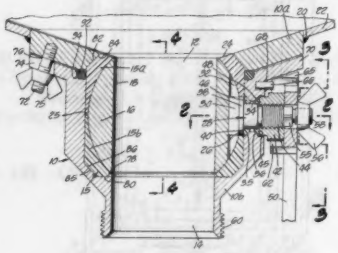
U.S. Cl. 251—61.2 **4 Claims**



A valve for reducing pressure in a hydraulic brake line upon skidding of a vehicle wheel. The valve is constructed with a bore having one end portion interconnected with the

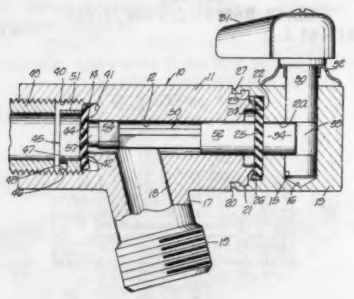
brake line, and a piston slidably disposed in the bore so as to form a chamber in communication with the brake line. The opposite end portions of the bore are in communication so that equal brake actuating hydraulic fluid pressure is exerted on each end of the piston. The valve contains a pressure differential operated member such as a piston or diaphragm which is operable to move the piston so as to seal the brake line and increase the volume of the chamber thereby reducing pressure in the brake line.

3,614,056
FLUSH BOTTOM TANK BALL VALVE
William Alvarez, Placentia, Calif., assignor to Jonathan Manufacturing Company, Fullerton, Calif.
Filed Feb. 12, 1970, Ser. No. 10,780
Int. Cl. F16k *5/02*
U.S. Cl. 251—144 **31 Claims**



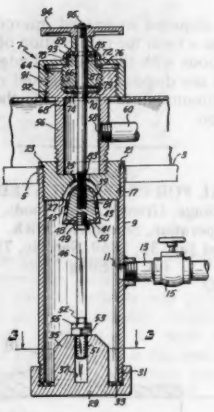
A valve body with coaxial inflow and outflow ports confines under pressure a plastic cage and a ball element having a diametrical passage therethrough rotates in the cage. Fluid pressure at the inflow port additionally pressurizes the cage and the sealing pressure of the cage is concentrated in two annular zones near the two ports. A radial operating stem is journaled in plastic seals that are pressurized by a nut on the stem. A valve handle which normally interlocks the nut with the stem may be removed to serve as a wrench for the nut.

3,614,057
FLOW CONTROL VALVE
Louis Hospe, 2603 Senator Ave., Harbor City, Calif.
Filed Oct. 22, 1969, Ser. No. 868,545
Int. Cl. F16k *31/52*
U.S. Cl. 251—251 **10 Claims**



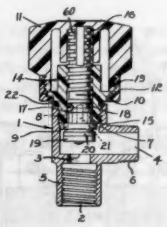
A control valve for fluids having a body with a cylindrical bore in which is mounted an actuating plunger. The body has an inlet port in one end of the cylindrical bore and a lateral outlet port. The inlet port has a flexible seal sealing against a valve seat and a retainer seat and dislodging from said valve seat on sliding movement of said plunger within said bore to engage the center of said flexible seal and push it away from said seat. The plunger has portions relieved to permit fluid passage around the plunger to the outlet port. A head is provided with a shaft rotatably mounted therein and carrying a valve handle and an eccentric portion. The eccentric portion engages a slug mounted in line with said plunger to force said plunger to open position on turning of said handle to open position. The head and the valve body confine between them a flexible seal for said head.

3,614,058
LEAKPROOF WATER SPIGOT
Phillip L. Crisp, 624 Lail St., Marion, N.C.
Filed Sept. 1, 1970, Ser. No. 68,636
Int. Cl. F16k *31/50*
U.S. Cl. 251—266 **6 Claims**



The valve head is mounted in the inlet casing for reciprocation but is prevented from rotating by being fixed on the upper end of a mounting rod which has a noncircular lower end extending into a cooperating noncircular recess with a sliding, nonrotating fit. The valve stem and the valve head have cooperating threads and the valve stem is held against axial movement so that rotation of the valve stem results in reciprocation of the valve head.

3,614,059
TAPS
Charles Rothauser, North Adelaide, and Bruce R. Thompson, Tranmere, both of Australia, assignors to Caroma Sales Proprietary Limited, Norwood, Australia
Filed Nov. 25, 1969, Ser. No. 879,852
Claims priority, application Australia, Dec. 2, 1968, 47134/68
Int. Cl. F16k *31/50*
U.S. Cl. 251—267 **5 Claims**



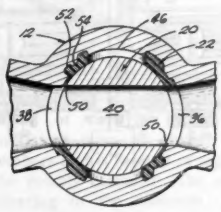
In a tap of the type comprising a hollow body with an inlet thereto and an outlet therefrom and a seat on the inlet and in which a sealing member can be moved down onto or retracted from the seat the improved construction comprising a knob rotationally supported from the body

preferably through a detachable member but confined axially in relation to the body so that rotation of the knob does not change its axial position, the knob nonrotationally engaging a control member which actuates the sealing member, the control member being in screw threaded engagement with a part of the body preferably the detachable member so that rotation of the knob moves the control member toward or away from the seat.

3,614,060
SLEEVED PLUG VALVE

Jacob B. Freed, and Donald R. Disbrow, both of Battle Creek, Mich., assignors to Union Pump Company, Battle Creek, Mich.

Filed July 22, 1969, Ser. No. 843,563
Int. Cl. F16k *5/04*
U.S. Cl. 251—317 **17 Claims**

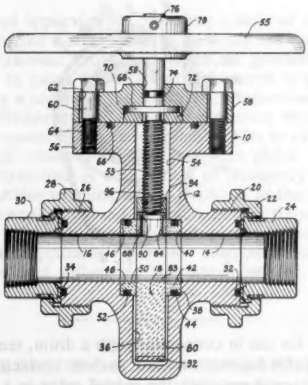


A sleeved plug valve having flow-throttling lug members at the ports in the valve body, such lug members constituting raised, islandlike projections from the walls of the valve chamber located immediately adjacent the side edge of the ports in the direction of throttling or closing plug movement, such lug members extending circumferentially of their respective ports only along such side edge and having a length which is only a minor portion of the total port circumference, and such lug members having a minimum width at their widest point which is a function of the maximum port dimension of the valve.

3,614,061
CERAMIC GATE VALVE

John R. Fitzpatrick, Tulsa, Okla., assignor to Charles Wheatley Company, Tulsa, Okla.

Filed Mar. 3, 1969, Ser. No. 803,622
Int. Cl. F16k *3/02, 3/314*
U.S. Cl. 251—327 **7 Claims**

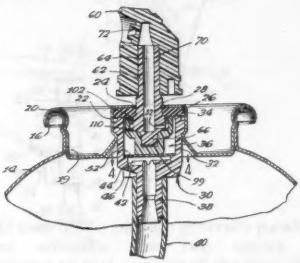


A gate valve having the gate member and valve seating portions constructed from a ceramic material for hardness and density qualities and extremely high resistance to chemical action and resistance to high temperatures. The valve gate member is particularly designed and constructed to maintain the ceramic material under compression at all times to assure excessive strength for the valve. In addition, the coaction between the ceramic gate and ceramic-seating members provides an optimum coefficient of static friction during operation of the valve for facilitating opening thereof.

3,614,062
AEROSOL VALVE

Clarence O. Kuffer, Niles, Ill., assignor to Valve Corporation of America

Filed July 18, 1969, Ser. No. 842,845
Int. Cl. F16k *31/524*
U.S. Cl. 251—354 **15 Claims**

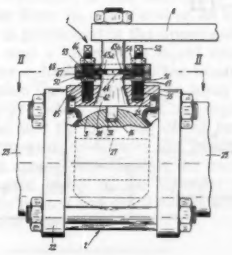


An aerosol valve assembly including a valve member disposed within a chamber defined by a body, the body being in sealing engagement with a gasket. The valve member is normally biased into engagement with the gasket and has a stem extending through the gasket to define an outlet. The biasing means for maintaining the valve in its normally closed position is a generally flat spring element disposed and supported transversely in the shell and in expansive bearing contact with the lower end of the valve member.

3,614,063
COCK WITH A ROTATABLE PLUG

Jean Gachot, 179 Avenue de la Division Leclerc, 95 Enghien (Val d'Oise), France

Filed Nov. 19, 1969, Ser. No. 878,055
Claims priority, application France, Nov. 26, 1968, 175,338
Int. Cl. F16k *41/02*
U.S. Cl. 251—355 **5 Claims**



A cock comprising a body, a rotatable plug accommodated within said body, a rotatable stem passing through the wall of said body to control the angular position of said plug, said stem including an enlarged portion defining a bearing surface engageable with a seating defined by an aperture in the body wall, a tightening flange to urge said bearing surface into sealing engagement with said seating, said bearing surface having a circular cross section which decreases towards the outside of said body and being coated with a self-lubricating sealing material.

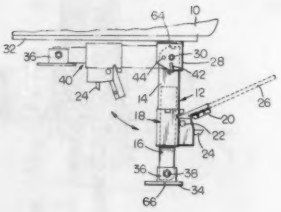
The stem is provided with an annular projection located outside of the body and the tightening flange is located between the body and the annular projection and bears on the latter. This arrangement affords improved fluidtightness and safe operation at high pressures.

3,614,064

STABILIZING JACK STRUCTURE FOR MOBILE VEHICLE

Winton J. Bennett, 1500 S. Dallas, Auburn, Ind.

Filed May 19, 1969, Ser. No. 825,561
Int. Cl. B60s 9/02
U.S. Cl. 254—86 R **4 Claims**



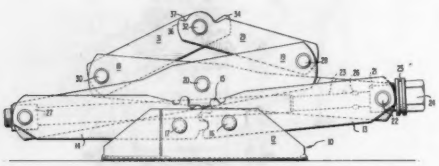
The invention pertains to a stabilizing jack structure for mobile vehicles and the like, in which two telescopically arranged members are interconnected by a lever-operated actuating mechanism which can be operated to vary the degree of telescopic engagement of said members. The upper end of said telescopic members is arranged for pivotal connection to the underside of a mobile vehicle, while the lower end of the members carries a ground-engaging member. The jack structure is swingable as a unit from a working position, wherein it extends vertically downwardly from the vehicle on which it is mounted up to a transport position wherein it is disposed parallel to and closely adjacent the bottom of the vehicle. The jack structure is arranged to be locked in each of its said positions on the vehicle.

3,614,065

VEHICLE JACK MECHANISM

Joseph Adamski, Brooklyn, Mich., and James W. Grim, Toledo, Ohio, assignors to Dura Corporation, Oak Park, Mich.

Filed Aug. 7, 1969, Ser. No. 848,147
Int. Cl. B66f 3/22
U.S. Cl. 254—122 **2 Claims**



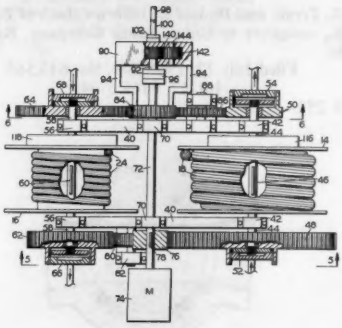
A scissors-type screw-actuated lift jack mechanism in which a secondary pair of links is mounted on the extended ends of the primary cross links to provide a substantial extended raised height of the lift jaCk while the mechanism in the retracted or lowered position is a more compacted and shortened package for storage purposes. The lift jack mechanism has a unique embodiment of a notch mechanism for engaging and retaining contact with the underbody structure of an automotive vehicle.

3,614,066

VARIABLE TENSIONING CABLE DRIVE FOR YARDERS AND THE LIKE

Vearl Day, 1335 S. W. Huntington Ave., Portland, Oreg.

Filed May 9, 1969, Ser. No. 823,342
Int. Cl. B66d 1/26, 1/44, 1/48
U.S. Cl. 254—185 **1 Claim**



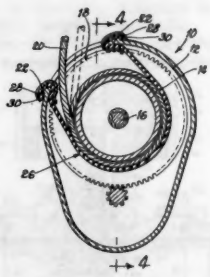
Main and haulback cable drum gears are coupled to a power-driven shaft through a coupling gear mounted on the shaft for independent rotation and connected to the shaft through the relatively rotatable housing and output shaft of a hydraulic motor. The drum gears are connected releasably to the associated drums by independently operable clutches.

3,614,067

MEANS FOR RETAINING A WOUND CABLE ON A DRUM IN A TAUT POSITION AND TO PREVENT CRISSCROSSING OF THE CABLE WINDS

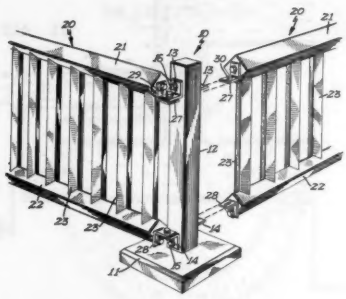
Howard H. Vermette, 7 143rd St., Hammond, Lake County, Ind.

Filed July 22, 1969, Ser. No. 843,415
Int. Cl. B66d 1/36
U.S. Cl. 254—190 **6 Claims**



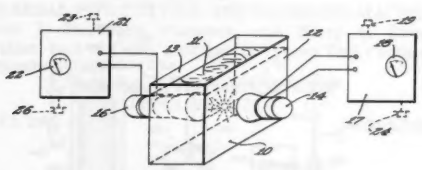
Means for use in connection with a drum, reel or spool on which a cable has been wound, such as a winch and the like, which serves to maintain the wound cable in a taut position on the drum or reel to prevent slackening of the cable and to maintain the successive cable turns in their relative positions to prevent crisscrossing of the cable turns. The said means includes a flexible and stretchable member which maintains a constant pressure or stress on the wound cable around the drum or reel.

3,614,068
PORTABLE LIVESTOCK PEN
Douglas E. Koehl, Hancock, Minn.
Filed Mar. 30, 1970, Ser. No. 23,616
Int. Cl. E04h 17/14
U.S. Cl. 256—19 7 Claims



A livestock fence of concrete is provided which collectively has sufficient mass to obviate the need for embedded post members and is formed of segments that are light enough to be readily movable. The preferred form utilizes steel reinforcing in the concrete. Joined to the reinforcing rod are metallic members to be used in joining sections of the fence.

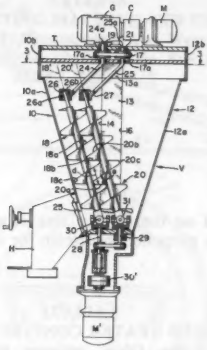
3,614,069
MULTIPLE FREQUENCY ULTRASONIC METHOD AND APPARATUS FOR IMPROVED CAVITATION, EMULSIFICATION AND MIXING
Edward J. Murry, Palos Park, Ill., assignor to Fibra-Sonics, Inc., Chicago, Ill.
Filed Sept. 22, 1969, Ser. No. 859,731
Int. Cl. B01f 11/02
U.S. Cl. 259—1 21 Claims



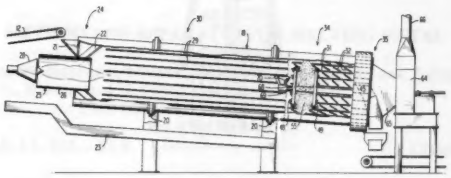
Method and apparatus for obtaining a state of cavitation, emulsification and mixing wherein materials are subjected to a band of ultrasonic frequencies which are gradually shifted downwardly to cause bubbles in the material to grow and then applying a second set of ultrasonic frequencies but of a much lower frequency and of a higher intensity than the first ultrasonic frequencies for causing the bubbles to expand to a size such that catastrophic collapse takes place. The low-frequency ultrasound is also varied in frequency so as to cause the bubbles to collapse and implode. In this case, the lower frequency is caused to increase in frequency by periodically sweeping the lower frequency upward. The method and apparatus provide improved cavitation, emulsification and mixing of substances as, for example, water-in-oil.

3,614,070
MULTIPLE ORBITING SCREW MIXING APPARATUS
Bernard A. Loomans, Saginaw, Mich., assignor to Baker Perkins, Inc., Saginaw, Mich.
Filed May 26, 1969, Ser. No. 827,563
Int. Cl. B01f 7/02
U.S. Cl. 259—102 10 Claims

A mixing apparatus for use with a mixer housing having generally conically-shaped sidewalls including a pair of orbitally mounted screws which cyclically wipe portions of the conical sidewalls to remove material adhering thereto. Each of the screws is also mounted for rotation about its own longitudinal axis, the longitudinal axes of the two screws being parallel to each other, and also generally parallel to the conically-shaped sidewalls. The two screws are in intermeshing relation so that portions of the two screws are in wiping engagement to effect a mutual wiping and cleaning.



3,614,071
ASPHALT PLANT DRYER-MIXER
James D. Brock, Chattanooga, Tenn., assignor to CMI Corporation, Oklahoma City, Okla.
Filed May 25, 1970, Ser. No. 41,145
Int. Cl. B28c 5/06
U.S. Cl. 259—147 15 Claims

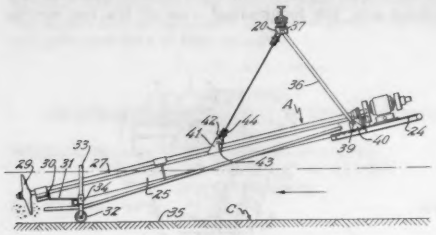


An asphalt plant dryer-mixer is disclosed wherein the aggregate of the mix is delivered to the upper end of an inclined rotatable cylinder, a fan induces a flow of air through the cylinder from its upper end to its lower end, an open flame burner is positioned at the upper end to heat the air and aggregate, and a bituminous liquid spray device is positioned within the cylinder to apply the bituminous liquid to the aggregate within the cylinder and to spray the particles of dust and airborne debris from the aggregate with the bituminous liquid so that the dust and debris become a part of asphalt mix. Temperature sensors are positioned within the cylinder and are arranged to regulate the burner intensity and rate of aggregate input to the cylinder so that the aggregate is properly heated and dried before the bituminous liquid is applied to the aggregate.

3,614,072
HYDRAULIC FLOW INDUCER
James H. Brodie, 2258 Fairmount Ave., Saint Paul, Minn.
Filed Jan. 2, 1969, Ser. No. 798,242
Int. Cl. B01f 7/06; B01d 21/18
U.S. Cl. 261—36 13 Claims

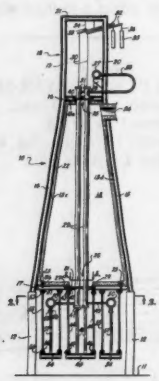
A method and apparatus for aerating and propelling sewage in an oxidation channel includes a support designed to extend into the channel in inclined position. A propeller shaft is supported on the support having a screw propeller on one (the lower) end and having a drive mechanism at the

upper end above the liquid level. The carrier liquid is circulated in the channel by the propeller. Air is discharged



into the liquid on the suction side of the propeller and is drawn into the propeller slipstream for intimate mixing with the liquid.

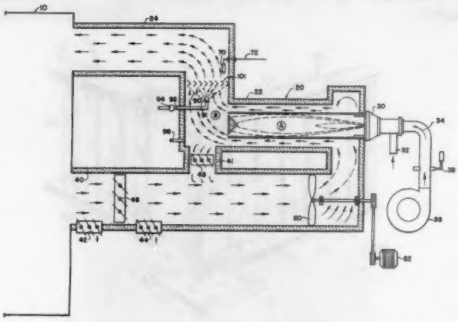
3,614,073
FIRED HEATER CONSTRUCTION
Sidney Born, Tulsa, Okla., assignor to Born Engineering Company, Tulsa, Okla.
Filed Dec. 17, 1969, Ser. No. 885,894
Int. Cl. F23l *15/04*
U.S. Cl. 263—20 **7 Claims**



A direct fired heater having a furnace chamber and a plurality of vertical tubes disposed therein which are extended through a sliding seal in the chamber floor and are engaged by a plurality of spring loaded legs mounted on swingable cradles. Beneath the chamber, each vertical tube has a small connector tube which is attached to an outlet manifold supported on legs extended upwardly from swingable manifold cradles. Each outlet manifold is connected to a centrally disposed collector conduit which is suspended from a transverse structural member by a plurality of sliding anchor supports.

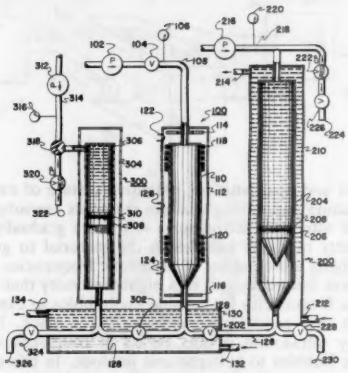
3,614,074
DIRECT-FIRED KILN FURNACE CONTROL SYSTEM
Walker L. Wellford, Jr., Memphis, Tenn., assignor to Moore Dry Kiln Company of Oregon, North Portland, Oreg.
Filed Nov. 14, 1969, Ser. No. 876,733
Int. Cl. F27b *3/02*
U.S. Cl. 263—40 R **13 Claims**

A direct-fired kiln furnace control system for lumber and like material utilizing a natural gas or oil burner with provision for spraying water into the furnace gases for humidification purposes wherein the furnace operation is controlled in response to not only a pair of sensor signals reflecting the dry bulb and wet bulb conditions in the kiln proper, but also in response to a sensor signal reflecting the temperature of the gases at the outlet of the furnace, so as to thereby insure the rapid, safe and effective vaporization of water introduced into the furnace gases. The three sensor signals are utilized to selectively control the combustion rate



of the furnace burner, as well as a combination of vent, damper and air fan means regulating the flow rate and recirculation of the heated gases through the kiln furnace, to thereby achieve and maintain required temperature and humidity conditions in the kiln.

3,614,075
VISCOSITY REDUCTION OF KAOLIN BY HYDROTHERMAL TREATMENT
Vernon J. Hurst, Athens, Ga., assignor to J. M. Huber Corporation, Locust, N.J.
Filed July 22, 1969, Ser. No. 843,656
Int. Cl. F27b *9/00*
U.S. Cl. 263—52 **7 Claims**



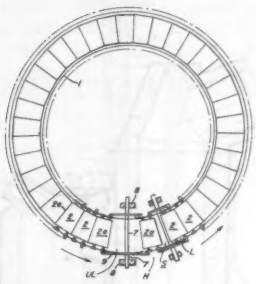
A hydrothermal treatment for processing kaolin clay slurries containing from 5–60 percent solids in which the plastic crudes are treated between 200° C.–460° C. at pressures up to 30,000 pounds pressure per square inch for from 1–60 minutes reduces the viscosity of the kaolin slurry at least 20 percent and often as much as 50 to 90 percent, producing viscosities on the order of 100 c.p.s. at 20 r.p.m. Brookfield or lower. A particularly advantageous embodiment of the present invention is the continuous hydrothermal treatment of kaolin slurries.

3,614,076

OPEN BURNER MACHINES FOR SINTERING ORES

Werner Schmidt, and Rudolf Hess, both of Frankfurt am Main, Germany, assignors to Dravo Corporation, Pittsburgh, Pa.

Filed Aug. 8, 1969, Ser. No. 848,527
Claims priority, application Germany, Aug. 10, 1968, P 17 58 805.5
Int. Cl. F27b 21/00
U.S. Cl. 266—21 5 Claims



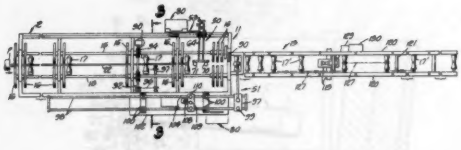
A circular traveling grate machine comprising a circular track over which a series of burner cars for forming sintered ore are moved, is disclosed. Each car has a trapezoidal burning surface upon which the sinter is burned. Each car is equipped with a first axle extending transversely of the track and equipped with two spaced nonflanged wheels engaging the track. A second axle of the car has mounted on each end thereof a wheel having an inner annular portion engaging the track and an annular outer portion, equipped with an enlarged inner flanged portion to be engaged by a rotating member which separates individual cars upon the track and advances them for discharge of their contents.

3,614,077

UNIVERSAL PIPE CUTTING AND HANDLING MACHINE

Marvin J. Blackburn, Pasadena, and Harry E. Criner, Walnut, both of Calif., assignors to Vernon Tool Company, Alhambra, Calif.

Filed Feb. 5, 1970, Ser. No. 8,872
Int. Cl. B23K 7/04
U.S. Cl. 266—23 N 31 Claims



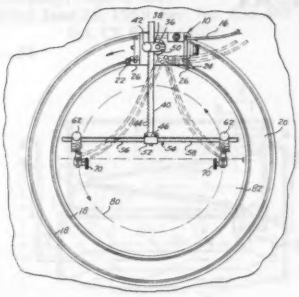
A one-man universal pipe mitering, bevelling, cutting and contouring machine, including power means for feeding uncut pipe therefrom to a classifying station, all operable by one man from a control console readily movable between two principal cutting stations. One cutting station is equipped with cutting torch means for making straight or bevelled cuts normal to the pipe axis and the other is equipped with contour generating mechanism for guiding the cutting torch means while making any of a wide variety of cuts in other than a normal plane and suitable for use in joining together two misaligned pipes. The machine includes two sets of power-driven rollers, one for rotating the pipe and one for moving the pipe axially forwardly or rearwardly as well as power means for raising the pipe off the pipe rotating rollers while being positioned opposite a selected cutting torch. Power-driven conveyor means delivers finished pipe to a classifying station and discharges the pipe to a selected receiving zone lengthwise of the conveyor and disposed to either side of the conveyor following which power means automatically restores the conveyor to its normal transporting position.

3,614,078

PLATE-CUTTING MACHINE AND THE LIKE

Ralph M. Hepler, 239 Pennsylvania Ave. West, Warren, Pa.

Filed Oct. 24, 1969, Ser. No. 869,200
Int. Cl. B23k 7/10
U.S. Cl. 266—23 K 10 Claims



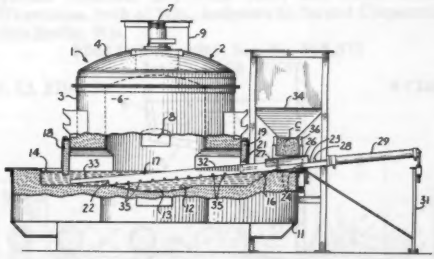
A machine for cutting patterns in a plate member comprising a self-propelled member with spaced wheel means thereon, track means for guiding said wheel means, said base member carrying adjustable bar means with a pair of cutting means disposed on the ends of said bar means for cutting a pattern in a plate member and the like in accordance with a master pattern.

3,614,079

METHOD AND APPARATUS FOR MELTING METAL CHIPS

George Harrison, 6901 W. 30th St., Berwyn, Ill., and Nelson K. Harrison, 432 Shanstone Road, Riverside, Ill.

Filed Oct. 16, 1968, Ser. No. 768,054
Int. Cl. C21b 11/00
U.S. Cl. 266—33 S 9 Claims

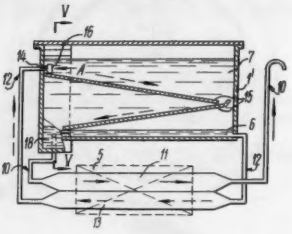


Method and apparatus for melting oil-contaminated brass chips comprises a reverberatory furnace and a melter tube that projects through the side of the furnace and into the bath of metal therein. Oil-contaminated metal chips are repeatedly charged into the tube by a plunger. The tube is perforated to expose the chips to the liquid metal of the bath and to the combustion chamber of the furnace. The chips are heated by the bath, vaporizing the oil and expelling it into the combustion chamber for burning and thereby maintain the chips and bath subjected to a reducing atmosphere. The heat of the bath melts the chips, the liquid metal from the melted chips flowing out of the tube.

3,614,080
DEVICE FOR MIXING CONDUCTIVE LIQUIDS WITH REAGENTS

Vladimir Mikhailovich Foliforov, ulitsa Gorkogo, 145/4, kv. 85; Boris Nikolaevich Ukraintsev, ulitsa L. Paegle, 24, kv. 6; Georgievich Sirotenko, ulitsa Strelkovava, 19, kv. 3; Aivar Eduardovich Tinte, ulitsa Moskovskava, 266/3, kv. 5; Boris Lvovich Birger, ulitsa Kranorarmeiskaya, 6, kv. 3; Aivar Yanovich Vilnitis, ulitsa Daugavgrivas, 132/6, kv. 21; Nikita Mikhailovich Nadezhnikov, ulitsa Ersikas, and Mark Ilich Grinshteen, F. Engelsa, 19, kv. 13, all of Riga, U.S.S.R.

Filed June 11, 1969, Ser. No. 832,341
Int. Cl. C21c 7/00, 7/10
U.S. Cl. 266—34 A 7 Claims

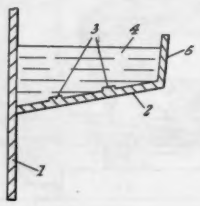


A device for mixing conductive liquids with reagents in which a vessel is provided with a discharge pipe. A reversible electromagnetic inductor is installed near the discharge pipe so that the mechanical force created due to the interaction of the magnetic field developed by the inductor with the currents induced in the conductive liquid is sufficient for discharging the liquid through the discharge pipe.

3,614,081
SPIRAL LAUNDERS

Leon Stocks, and John Frederick Castle, both of Avonmouth, England, assignors to The Broken Hill Associated Smelters Proprietary Limited, Melbourne, Australia

Continuation-in-part of application Ser. No. 661,397, Aug. 17, 1967, now abandoned. This application Dec. 9, 1969, Ser. No. 883,657
Int. Cl. C22b 9/04
U.S. Cl. 266—34 V 6 Claims

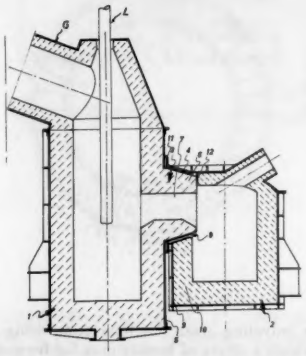


When flowing molten metal down a spiral channel within an evacuated vessel to effect rapid distillation of, say, zinc from zinc-contaminated molten lead, splashing occurs and much lead is carried over with the zinc distillate. To overcome this, brakes in the form of upstanding ridges running along the spiral path within the spiral channel are provided to increase the wetted perimeter of the channel which maintains the internal turbulence of the molten metal and also renders the surface thereof adequately smooth to minimize splashing. When the molten metal is zinc-contaminated lead, it is necessary that the speed be no greater than 5 ft./sec.

3,614,082
METALLURGICAL APPARATUS

Claude Tsymbal, Metz, France, assignor to Institut de Recherches de la Siderurgie Francaise, Germain en Laye, France

Filed Aug. 27, 1969, Ser. No. 853,253
Claims priority, application France, Aug. 28, 1968, 164458
Int. Cl. C21b 7/14
U.S. Cl. 266—38 11 Claims

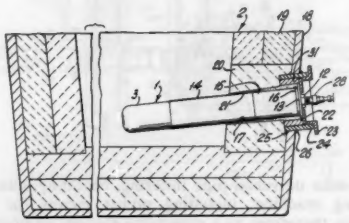


The refining vessel wherein molten pig iron is refined by top blowing is provided with a nozzle which is removably fitted into a complementary opening provided in the sidewall of a decantation vessel into which the metal and slag overflow. The refining vessel is moved away from and thus withdraws its nozzle from the opening of the decantation vessel when the refractory material of the spout and/or refining vessel requires replacement or overhauling.

3,614,083
OUTSIDE CHANGE TUYERE

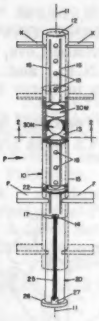
Ronald L. W. Holmes, New Providence, N.J., assignor to Union Carbide Corporation

Division of Ser. No. 653,929, July 17, 1967, Pat. No. 3,495,815.
Filed May 2, 1969, Ser. No. 864,233
Int. Cl. C21c 5/46
U.S. Cl. 266—41 6 Claims



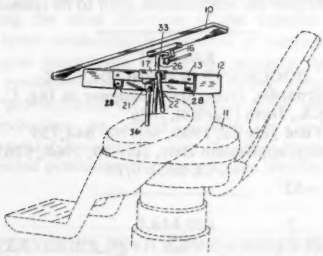
Blowpipe assembly for introducing gas below the surface of a molten metal bath which is capable of rapid removal and installation in an opening in the wall of a refractory lined processing vessel. The assembly consists of a metal blowpipe having a nozzle capable of discharging a sonic velocity gas stream, and refractory protection substantially surrounding and secured to the blowpipe so that the blowpipe and refractory constitute an integral assembly. The vessel opening is provided with wear and erosion resistant refractory lining forming a socket for the blowpipe assembly. The assembly can be inserted into, removably secured to, and removed from the vessel from the outside.

3,614,084
RESILIENTLY COMPRESSIBLE SPRING MECHANISM
Richard L. Brown, 1812 Pelton Ave., Bellevue, Nebr.
Filed July 11, 1969, Ser. No. 841,021
Int. Cl. A63b *25/08*; F16f *1/44*, *3/08*
U.S. Cl. 267—153 14 Claims



A resiliently compressible spring mechanism utilizing a plurality of separate resiliently compressible compressive units slidably associated and longitudinally consecutively disposed within an elongate hollow housing having a pair of endwalls adapted to longitudinally resiliently compressibly deform and translate the intervening compressive units when one endwall is moved under load conditions toward the other end wall. Each compressive unit includes a collar portion longitudinally slidably associated with the housing and a lengthier resinous mass portion providing spacing between the collar portions of adjacent compressive units. Convergent resinous mass portions afford an exceedingly lively pogo or jumping stick amusement device.

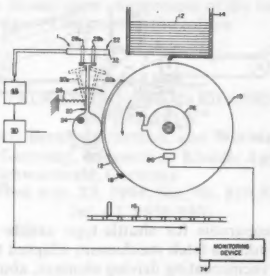
3,614,085
ADJUSTABLE ARM BOARD
John B. Cunningham, 425 West 10th St., Erie, Pa.
Filed May 12, 1969, Ser. No. 823,724
Int. Cl. A61g *13/00*
U.S. Cl. 269—328 1 Claim



An arm board and arm member combination which can be supported on the arm rest of a dental chair and whereby the arm of a patient may be adjusted to incline up and down or laterally.

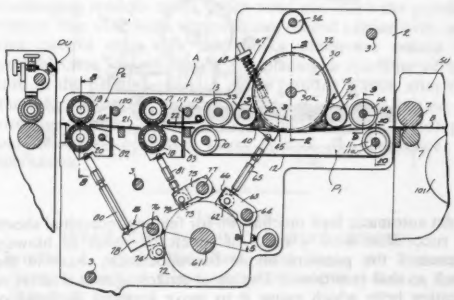
This disclosure contains a description of the preferred form of an arm board which is suitable for use by anesthetists in connection with their practice in holding a patient's arm in the desired position for intravenous anesthesia at the chair. The board is supported for forward and rearward movement on a track member that is fixed to the side of the chair arm; a bracket is supported on the track and may be adjusted forward and rearwardly on the track. The bracket has a vertically extending bore which receives the vertically extending portion of a rod. The rod may be locked in selected vertical position in the bracket by a handle connected to a clamping screw. A second bracket is fixed to the bottom of the arm board and the second bracket has a laterally extending bore which receives the laterally extending part of the L-shaped rod. The arm board can rock forward and rearward and can be adjusted laterally on the lateral part of the rod. A clamp screw with suitable handle is provided to lock the arm board in the desired inclined lateral position to best suit the convenience of the anesthetist. The arm board likewise has utility when mounted on the side rail of a surgical table for anesthesia during operating procedure.

3,614,086
FLUIDIC CALIPER
Thomas Wilbur Bushnell, E. Aurora, N.Y., assignor to J. W. Clement Company, Depew, N.Y.
Filed June 25, 1969, Ser. No. 836,469
Int. Cl. B65h *43/02*
U.S. Cl. 270—56 6 Claims



A fluidic caliper adapted for use with a signature- or sheet-collating system, wherein the caliper is adapted to detect a malfunction in delivery of a signature by a feeder onto a collating conveyor. The caliper includes a feeler arm positionable in accordance with the feeding condition of the feeder, and a feeler arm detector having a pair of proximity sensors cooperating to produce a signal indicative of the position of the feeler arm. The caliper includes means associated with the feeler arm, which is adapted to permit the caliper to be readily adjusted in accordance with the thickness of a signature whose presence is to be detected.

3,614,087
CARTON BLANK HANDLING APPARATUS
Raymond Swansen, Jr., West Allis, and Peter Zernov, Wauwatosa, both of Wis., assignors to Zerand Corporation, New Berlin, Wis.
Filed Oct. 22, 1969, Ser. No. 868,378
Int. Cl. B65h *39/08*
U.S. Cl. 270—60 8 Claims



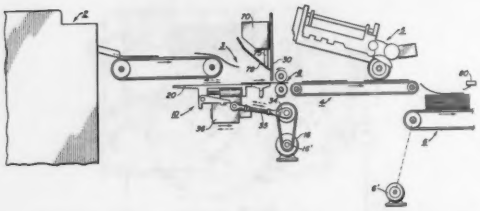
Apparatus for handling carton blanks or the like as they are being delivered through carton-making equipment, such as from a stripper unit to a delivery unit in in-line paper-

converting equipment. The apparatus consists of a diverter mechanism which diverts every other one of the blanks into a circuitous path where it is then deposited on the succeeding blank, thereby doubling up on the blanks, that is arranging them in stacked pairs. Thus, the linear speed of the blanks as they leave the apparatus can be only half as fast as the linear speed of the blanks when they enter the apparatus.

3,614,088
ARTICLE-PROCESSING SYSTEM WITH FEEDER SHUTTLE DISCONNECT

Donald W. Watson, Arlington Heights, Ill., assignor to Xerox Corporation, Rochester, N.Y.

Filed Nov. 12, 1968, Ser. No. 774,957
Int. Cl. B65h 29/22
U.S. Cl. 271—4 **2 Claims**

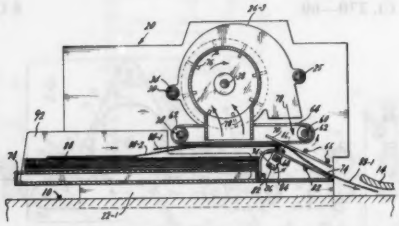


A driving apparatus for shuttle-type article feeders, the apparatus including a latch mechanism adapted to couple the shuttle with a reciprocating driving element, abutment means selectively interposed in the path of movement of the latch mechanism and contactable with an operating arm of the latch mechanism to cause release of the latch mechanism and uncoupling of the shuttle, means to restrain the shuttle against movement when uncoupled, and control means limiting uncoupling of the shuttle to a predetermined shuttle-operating position.

3,614,089
AUTOMATIC ORIGINAL FEEDER FOR COPYING MACHINE

John A. Van Auken, Miami Beach, Fla.; Christopher Rush, Ithaca, N.Y.; Fritz A. Blank, Hollywood; Lionel Hoffman, Fort Lauderdale, Fla., and Robert Barto, Des Peres, Mo., assignors to Copystatics Manufacturing Corporation, Miami Lakes, Fla.

Filed June 16, 1969, Ser. No. 833,530
Int. Cl. B65h 3/12
U.S. Cl. 271—26 R **21 Claims**

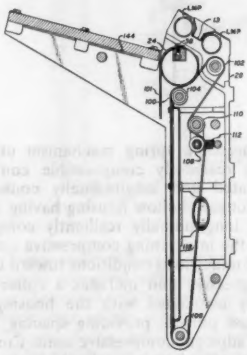


An automatic feed mechanism for feeding individual sheets in succession from a stack of sheets. A series of blowers decreases the pressure above the uppermost sheet in the stack so that it is raised. The sheet strikes against a series of rotating belts which cause it to move forward. A series of stripper wheels, rotating in the same direction as the belt, is disposed forward of the forwardmost edges of the sheets in the stack and below the belt. In the event more than one sheet have been lifted from the stack and are moving in the forward direction, the stripper wheels bear against the lower surface of the lowermost sheet and force it back into the stack. The force imparted by the stripper wheels is greater than the normal friction force between two adjacent sheets. The stripper wheels have no effect on a single sheet moving in the forward direction because the reverse force imparted by the wheels to this sheet is less than the forward force imparted by the belts.

3,614,090
DOCUMENT CONVEYOR

George D. Del Vecchio, Briscoe Cove, North Rose; Edward A. Schwartz, Fairport, N.Y., and Norman L. Yarger, Marengo, Ill., assignors to Xerox Corporation, Rochester, N.Y.

Filed June 2, 1969, Ser. No. 829,608
Int. Cl. B65h 5/12
U.S. Cl. 271—51 **11 Claims**

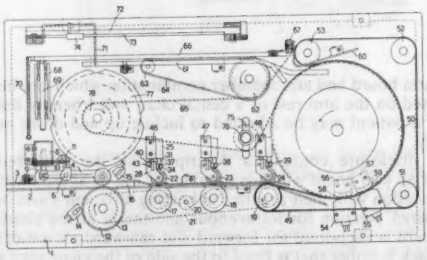


A document conveyor assembly for moving a document past a work station. The assembly includes a drum for releasably supporting the leading edge of the document, drive means to rotate the drum so that at least a portion of the document is moved past the exposure slit and supplemental conveyor belts to continue the movement of the document past the exposure slit even though the conveyor drum is stopped. Programming means are also employed to cause a predetermined number of passages of the document past the work station prior to its release.

3,614,091
DOCUMENT FEEDING DEVICE

Francesco Bernardis, Ivrea, Italy, assignor to Ing. C. Olivetti & Co., S.p.A., Ivrea (Torino), Italy

Filed July 22, 1969, Ser. No. 844,739
Claims priority, application Italy, July 30, 1968, 52633-A/68
Int. Cl. B65h 9/16
U.S. Cl. 271—52 **1 Claim**



A device for feeding and reading documents is disclosed. The documents are introduced one at a time into the receiving means of the device and fed to an aligning means moving each received document along an aligning path. The

aligning means comprise a driven first plurality of rollers adapted to act frictionally on a side of the received document and a plurality of second rollers acting frictionally on the opposed side of the same document. The second rollers have their spindles resiliently skewed obliquely with respect to the aligning path so as to urge the moving document transversely of the path against a reference surface. The apparatus includes also means for conveying the moving document past a reader and delivering it to a collecting pocket disposed in the opposite direction to the aligning path. The pocket collects and presses the successive documents as delivered by the conveying device.

3,614,092

SHEET TRANSFER MECHANISM FOR SHEET FED ROTARY PRINTING PRESSES

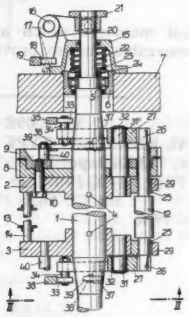
Franz Moos; Gerhard Loffler, and Arthur Brechtel, all of Frankenthal/Upper Palatinate, Germany, assignors to Schnellpressenfabrick Frankenthal Albert & Cie, Aktiengesellschaft, Frankenthal-Pfalz, Postfach, Germany

Filed Sept. 3, 1968, Ser. No. 756,960

Claims priority, application Germany, Sept. 4, 1967, P 16 11 287.1

Int. Cl. B65h *9/12*

U.S. Cl. 271—52 **17 Claims**



This invention provides a sheet transfer mechanism for sheet fed rotary printing presses. A conventional transfer drum is provided with an angular lever mechanism for controlling the axial direction of the transfer drum. The angular lever mechanism is operated in conjunction with a control gear mechanism to provide separate operations on specific revolutions of the transfer drum. Gripper support spindles are mounted on the transfer drum with a control gear mechanism to effect a shift in a substantially circumferential direction to place the sheet being transferred in the desired position with respect to the transfer drum.

3,614,093

SUPERVISORY DEVICE FOR A SHEET FEEDER

Adolf Schwebel, Offenbach am Main, Germany, assignor to Mabeg Maschinenbau GmbH Nachl. Hense & Pleines GmbH. & Co., Offenbach am Main, Germany

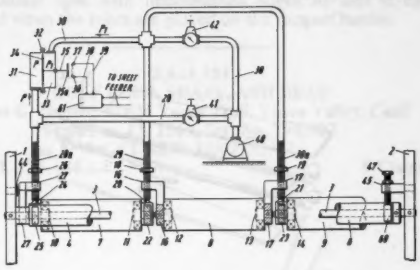
Filed Oct. 13, 1969, Ser. No. 865,567

Claims priority, application Germany, Dec. 7, 1968, P 18 13 300.1

Int. Cl. B65h *7/06*

U.S. Cl. 271—56 **11 Claims**

A supervisory device for protecting a sheet feeder against damage or operational failure as may be caused by sheets with turned-over edges or the presence of foreign material such as wastepaper pieces, etc. on sheets conveyed by the sheet feeder, has swingably mounted probe rollers which let the sheet flow past without being acted upon by the same but one or more which are lifted out of a normal or rest position by engagement with a sheet with a turned-over edge or with foreign material. Lifting of any one of the probe rollers initiates suitable control functions such as stopping the sheet feeder. The device also includes means neutralizing the effect



of temporary shocks or vibrations experienced by the probe rollers of the device upon engagement of the leading edges or the trailing edges of sheets with the rollers.

3,614,094

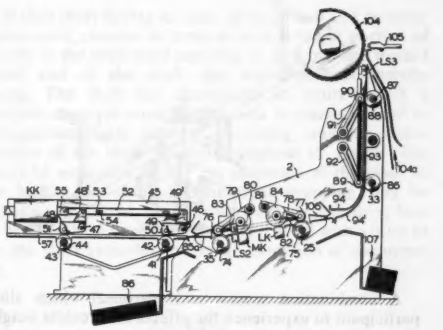
DATA PROCESSING AND CARD ASSORTING APPARATUS

Gerhard Mutz; Bernhard Hettich, and Werner Moser, all of Villingen, Germany, assignors to Kienzle Apparate GmbH, Villingen/Schwarzwald, Germany

Filed Apr. 23, 1969, Ser. No. 818,523

Int. Cl. B65h *9/00*

U.S. Cl. 271—59 **13 Claims**



Cards are transported by reversible transporting means between an input station, a readout station, and a printing station. Routing means are disposed between the input station and the readout and recording station for discharging returned cards, and other routing means are located between the readout and recording station and the printing station for discharging readout cards which need not reach the printing station. The card has a magnetizable record carrier strip, and also control strip with line marks which are sensed by photoelectric sensing means for placing a free line of the card in the printing position at the printing station after the line information has been read out at the readout station. A programmed data processing computer including a storage, and manually operated keys, control the sequence of operations.

3,614,095

SEPARATOR FOR JUXTAPOSED SHEETS

Christian A. Beck, Ridgefield, and Franz A. Tomasch, Norwalk, both of Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

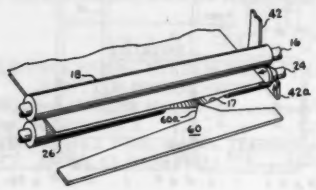
Filed Mar. 27, 1970, Ser. No. 23,215

Int. Cl. B65h *29/64*

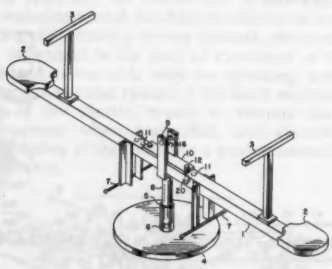
U.S. Cl. 271—64 **12 Claims**

A pair of feed rollers is arranged transversely to the path of travel of a pair of juxtaposed sheets. One feed roller has

spaced surface portions in peripheral surface contact with the other feed roller. One surface portion is momentarily axially shifted toward the other by actuator means to create a buckle in the leading edge of one sheet. A separator element intercepts the buckled leading edge of the one sheet to separate the pair while in transit.



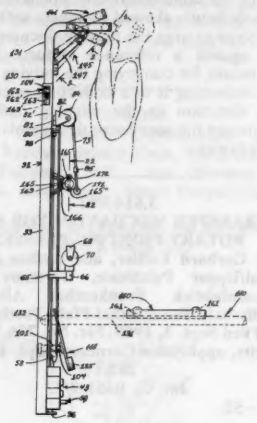
3,614,096
COMBINATION SEESAW AND CARROUSEL
John E. Ely, 1605 Atlas, Dallas, Tex.
Filed July 22, 1969, Ser. No. 843,721
Int. Cl. A63g *1/32, 11/00*
U.S. Cl. 272—30 **5 Claims**



A combination seesaw and carrousel which allows the participant to experience the effects of forceless weights. The device is capable of two axial motions at the same time with the ability in the participants to combine the motions as desired. The vertical axle spins laterally on ball bearings inside a vertically suspended housing attached to a base. Contrary to prior art devices the fulcrum or pivot is located above the suspension bar, so that a line connecting the centroids of the participants intersects the fulcrum and all resultant forces pass vertically downward through the vertical axis so that the device is stable without the need of being permanently anchored whether spinning, swinging, or dipping. Adjustability is provided to compensate for vast differences in the weights and heights of the participants.

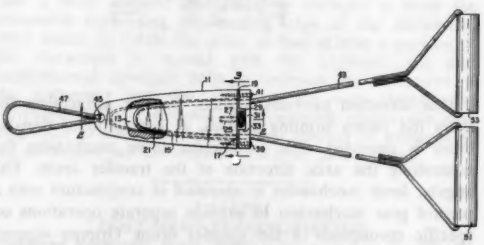
3,614,097
WEIGHT LIFTING EXERCISING APPARATUS
Harry Blickman, New York, N.Y., assignor to S. Blickman Inc., Weehawken, N.J.
Filed Jan. 28, 1969, Ser. No. 794,506
Int. Cl. A63b *21/06*
U.S. Cl. 272—72 **9 Claims**

An exercising apparatus for toning up various parts of the human body including pulley weights, chinning bars, parallel horizontal bar, rowing seat, hand strengthening roll and foot exerciser. The apparatus has an upright stationary frame, adapted to be mounted on a wall or closet door, and a U-shaped frame pivotally mounted on the stationary frame. Pulleys, ropes and weights are mounted on the stationary frame as well as pivotable rests for the feet, and rollers for hand exercising, and rowing seat on the pivotable frame. The weights slide on laterally spaced vertically extending bars supported in the side posts of stationary frame. The weights



are cylindrical members which are combined with one another by moveable pins to provide variable amounts of weights.

3,614,098
FRICTIONAL-RESISTANT-TYPE EXERCISING DEVICE
Byrle H. Carr, 133 Larkspur Drive, Twin Falls, Idaho
Filed July 8, 1969, Ser. No. 839,856
Int. Cl. A63b *21/00*
U.S. Cl. 272—79 R **9 Claims**

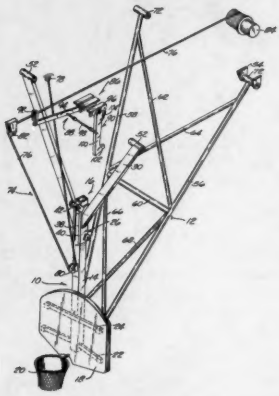


An exercising device having an outer sleeve with a wedge-shaped hollow interior and a solid wedge which is insertable within the sleeve. A rope passes about the solid wedge so as to be frictionally engaged between the wedge and the interior of the sleeve. The position of the wedge is adjustable so as to vary the frictional drag on the rope.

3,614,099
RETRACTABLE OVERHEAD BASKETBALL BACKBOARD SUPPORT STRUCTURE
Richard L. Sarno, New Berlin, Wis., assignor to "Automatic" Sprinkler Corp. of America, Cleveland, Ohio
Filed Feb. 26, 1969, Ser. No. 802,422
Int. Cl. A63b *63/04*
U.S. Cl. 273—1.5 R **4 Claims**

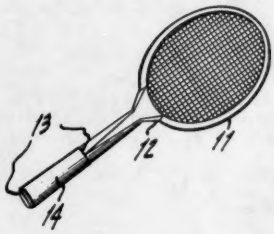
A retractable basketball backboard support structure supported from an overhead ceiling support structure including a front support assembly having a lower unitary post member on which the backboard is mounted. The lower post member is telescopically engaged with the collar of an upper yoke assembly having antifriction rollers which assembly is pivotally connected to the overhead support structure. A rear support assembly is pivotally connected at its upper end to the overhead support structure and pivotally connected at its lower end to the lower portion of the post

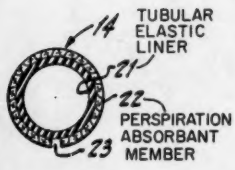
member on which the backboard is mounted. A hoist means is provided to raise and lower the backboard support structure between playing and storage positions, and the present invention contemplates both a forward fold and a backward fold arrangement. In the forward fold embodiment, the rear support assembly is rigid from end to end and the hoist means is adapted to pivot the front and rear support assemblies forwardly as the backboard support structure is



raised from playing to storage position. In the backward fold embodiment, the rear support assembly is comprised of a pair of separate sections pivotally connected together, which sections collapse upwardly during the backward folding operation. A safety latch mechanism is provided to prevent the support structure from swinging downwardly in an unrestrained manner from storage position in the event of a failure in the hoist means.

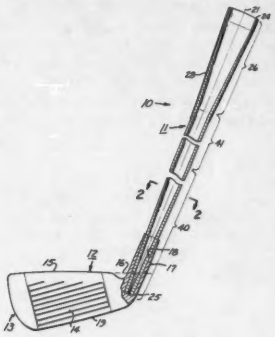
3,614,100
PERSPIRATION ABSORBANT SLEEVE FOR A RACQUET HANDLE
Harvey D. Spitz, 459 Barton Pl., N. Brunswick, N.J.
Filed Nov. 4, 1968, Ser. No. 786,794
Int. Cl. A63b *49/00*
U.S. Cl. 273—75 **3 Claims**





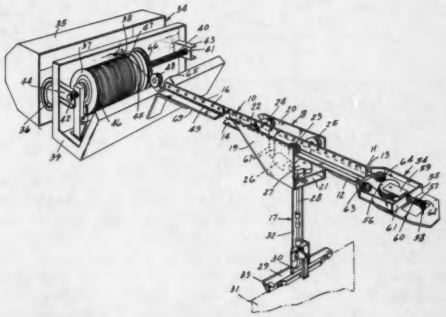
A removable sleeve for a racquet handle comprises a form fitting, elastic, perspiration absorbent body. The body may be comprised of an inner tube surrounded by an outer tube. The inner tube is elastic so that it may be stretched over the racquet handle. The outer tube is of terrycloth and has a longitudinal split with unconnected edges so that it can expand when the tubes are placed on the racquet handle.

3,614,101
GOLF CLUB, SHAFT, AND HEAD
Charles G. Hunter, 57835 Yucca Trail, Yucca Valley, Calif.
Filed Jan. 13, 1969, Ser. No. 790,602
Int. Cl. A63b *53/02, 53/12*
U.S. Cl. 273—80.2 **9 Claims**



A golf club shaft having an axis, an inner wall and an outer wall, both axial, circular in cross section, a major portion of it adjacent to the club head tapering so as to narrow toward the head end of the shaft, the wall thickness thereby increasing. The shaft has throughout its entire length a substantially constant cross section area in planes normal to the longitudinal axis thereby providing uniform linear distribution of the shaft weight throughout its length. The shaft may be expanded beyond an extension of the taper to form a handle, to which a lightweight wrapping may be applied as a grip. A club head includes a body, a striking face on the body with an upper margin, and a hosel with a bore to receive the shaft extending below an extension of the upper margin.

3,614,102
AUTOMATIC TARGET CONTROL SYSTEM
Joseph Nikoden, Sr., Miami, Fla., assignor to Detroit Bullet Trap Corporation, Schaumberg, Ill.
Filed July 24, 1969, Ser. No. 844,372
Int. Cl. A63b *63/06*
U.S. Cl. 273—105.6 **10 Claims**



A target carrier system including a target carrier which is mounted for longitudinal movement along a track and which

has means for manipulating the target. The target carrier includes a target turner motor which is moved with the target along the carrier track by means of a cable drive system. The cable drive system includes a housing which supports a cable spool on a threaded shaft. The shaft is fixedly positioned within the housing, and means are provided to rotate the cable spool, thereby allowing the spool to translate along the threaded shaft. The threaded shaft is positioned generally perpendicularly of the carrier track so that the cable spool is translated in such a manner as to allow a cable to unwind from the spool at a point which is generally fixed with respect to the track. The cable which drives the target carrier is wound about the cable spool, and a loop portion of the cable extends along the length of the track and is fixed to the target carrier to move the same as the spool rotates. This cable is an electrical conductor and is coated with an electrical insulating material to allow the conductor to act both as the drive force for the target carrier and also as the power line to the target turner motor. The carrier track also has an insulation lining which acts to insulate and guide the cable in its sliding movement along the track.

3,614,103
ARROWHEAD
Cornelius F. Carroll, 1310 Tuxedo Ave., Parma, Ohio
Filed Nov. 24, 1969, Ser. No. 879,401
Int. Cl. F41b *5/02*
U.S. Cl. 273—106.5 B **10 Claims**

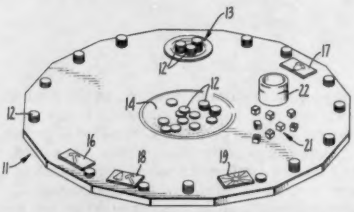
A broadhead for an arrow comprising an elongated conical body member having a forward pointed end and a cylindrical rear extension attached to the base of the conical member and adapted to be entered into a tubular arrow shaft or adapter. There is an axial slot extending forward from the rear end of the cylindrical rear extension, and into the elongated conical body through a portion of its length, into which is fitted a flat cutting blade. The forward end of the blade is spaced rearward from the forward end of the body to provide a relatively long leading spike, the blade having a forward edge abutting the forward end of the body slot, a rear shoulder at the point of juncture between the conical body member and the cylindrical rear extension, abutting the end of the hollow arrow shaft and a rearwardly extending tang entering the hollow arrow shaft. The front end of the blade and the front edge of the slot have a cooperating tang and reentry portion to prevent lateral displacement of the blade. In a second embodiment there is a second slot at right angles to the first slot, and of lesser extent, extending the conical member, the cylindrical rear extension and the first blade. A second blade, similar to the first blade is fitted in the second slot.

3,614,104
THREE-DIMENSIONAL SPACE GAME
Joseph E. Gregory, 834 Dupont Bldg., 169 East Flagler St., South Miami, Fla.
Filed July 18, 1969, Ser. No. 842,955
Int. Cl. A63f *3/04*
U.S. Cl. 273—134 AA **9 Claims**

A three-dimensional space game in which rocket ship configurated play pieces are first individually moved on a primary play surface, by the participants, from home base areas designated "rocket factories" to "hanger areas," and then along a path consisting of a plurality of delineated "move" areas to "launch pad" areas. From the "launch pad" areas, the play pieces are moved individually upwardly along riser means to an "orbital tract" and "space stations" from which they "blast off" and are moved further upwardly along additional riser means to a final goal, positioned thereabove, which may be designated "Mars" or any other well-known space body. The movement of the play pieces about the

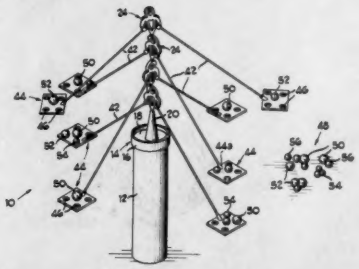
three-dimensional play area is controlled by the numbers appearing on a pair of thrown dice, a number indicating spinner means or the like.

3,614,105
GAME APPARATUS UTILIZING DICE AND CARDS
Juliana S. Dandini, 101 Greenridge Drive, Reno, Nev.
Filed Jan. 3, 1969, Ser. No. 788,732
Int. Cl. A63f *9/04, 1/04*
U.S. Cl. 273—146 **4 Claims**



A game apparatus in which a specific form comprises a plurality of value pieces such as poker chips for division among the players and placement in one of two playing trays during the game, a plurality of cards containing picture elements, one of said cards containing at least two picture elements, one of which elements corresponds to a picture element of another card and the other of which elements corresponds with a picture element of a second separate card, and a special set of dice exemplified by eight cubical dice, each die having five blank faces and one face containing a marking, said markings on the eight dice indicating the numbers one through six and the pair of picture elements corresponding to the two picture elements carried on said cards.

3,614,106
BALANCING PUZZLE DEVICE
Howard J. Morrison, Highland Park, and Marvin I. Glass, Chicago, both of Ill., assignors to Marvin Glass & Associates
Filed Aug. 6, 1970, Ser. No. 61,714
Int. Cl. A63h *13/12;* **A63f** *9/06*
U.S. Cl. 273—156 **12 Claims**



A puzzle game of the type wherein balancing members are to be stacked in vertical tandem orientation from a base and

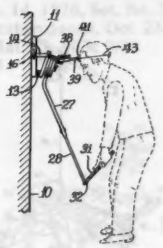
include outwardly extending arms having weight-receiving trays at the ends thereof with weight members of different weights for deposit on the trays to balance the vertically oriented assembly of the members. The weight members are variously of different sizes and correspondingly different weights, and of the same size but of different weights.

3,614,107
GOLF TRAINING DEVICE
James M. Kinsey, 4125 North Clinton St., Fort Wayne, Ind.
Filed May 13, 1970, Ser. No. 36,908
Int. Cl. A63b *69/36*
U.S. Cl. 273—188 A **4 Claims**

The golf training device limits movement of the golfer's foot so that during the backswing and power swing, the pivot foot is confined to rolling from the inner edge to the outer edge of the shoe. This is accomplished by means of a locator which is either a permanently fixed post or a post which can be removably imbedded in the ground and has a locating surface against which the back of the shoe is brought. An attachment which is received on the golfer's shoe has a projection which bears against the lower edge of the locating surface, thus preventing lifting of the shoe and thereby maintaining the proper foot position of the golfer at his pivot foot during both the backswing and the power swing. During the golfing swing, the projection on the attachment which is carried by the golfer's shoe engages the undersurface of the locator, and confines the foot to the described rolling action from the inner shoe edge to the outer shoe edge, thereby insuring a proper swing of the golfer, and, in particular, prevents lifting of the heel off the ground and spoiling the swing.

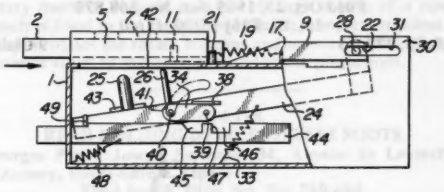
3,614,108
GOLF PRACTICE DEVICE
Ernest Garten, 411 S. Vail, Arlington Heights, Ill.
Filed Apr. 9, 1970, Ser. No. 26,906
Int. Cl. A63b *9/36*
U.S. Cl. 273—190 R **12 Claims**

A plate is connected at its bottom by a hinge to a vertical support. Brackets at the top of the plate can be connected to the support in various positions to change the angle of inclination of the plate. An arm is rotatably connected to the plate for rotation about an axis normal to the plate. The frictional drag of the rotation of the arm may be adjusted. On the distal end of the arm is a simulated golf club handle.



Immediately above the axis of rotation of the arm is an adjustably positioned headrest.

3,614,109
MAGNETIC TAPE RECORDER OF MAGAZINE TYPE
Kozo Yamamoto, Hirakata, and Morihisa Naito, Moriguchi, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Division of Ser. No. 711,677, Mar. 12, 1968, Pat. No. 3,540,738.
Filed July 8, 1970, Ser. No. 53,165
Int. Cl. G11b *15/00*
U.S. Cl. 274—4 E **5 Claims**

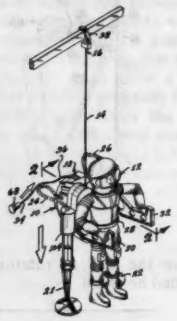


A magazine-type tape recorder wherein there are relative pivotal and linear movements between a movable body having a tape drive system and a magazine load system, comprising means for pivotally and linearly movably supporting one end of the movable body, a locking means for holding the movable body in an operative position, arcuate guide slots on the sides of a casing for guiding other ends of the movable body in the operative position or an inoperative position, means disposed on said casing and slidable along slots thereon by being engaged by said inserted magazine, first resilient means disposed between the movable body and said casing for urging the body towards the inoperative position, and second resilient means disposed between said slidable means and said casing for urging said slidable means towards said magnetic insertion opening, whereby the tape magazine can be ejected sufficiently out of the magazine insertion opening in response to an unlocking operation for the withdrawal of the tape magazine from the tape recorder.

3,614,110
VOICE UNIT BACKPACK
James E. Marshall, Westminster, and Richard E. Henderson, Huntington Beach, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.
Filed Nov. 13, 1969, Ser. No. 876,341
Int. Cl. G11b *3/00*
U.S. Cl. 274—9 R **4 Claims**

Apparatus in the form of a backpack for holding an astronaut figure, which plays a recorded saying as the pack and figure are lowered to the ground. The pack has a phonograph with a turntable that is rotated to play the record by pulling a string out of the pack. The string is pulled out by holding an outer end of the string and allowing the pack to

slowly fall to the ground. The phonograph is contained in a housing, and the housing is supported on a pair of elongated



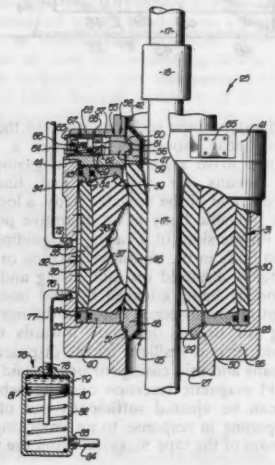
members representing struts, the members having an integral strap for holding the toy figure to the housing.

3,614,111

TOOL JOINT STRIPPING STATIONARY BLOWOUT PREVENTER WITH A RETRIEVABLE PACKING INSERT

John Regan, 26923 Diamondhead Lane, Palos Verdes Peninsula, Calif.

Filed Oct. 23, 1969, Ser. No. 868,870
Int. Cl. F16j *15/00, 15/40*
U.S. Cl. 277—3 **9 Claims**



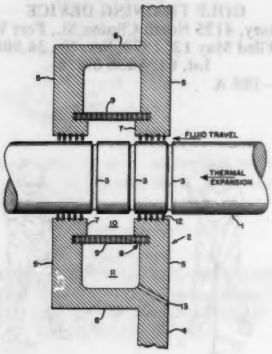
A stationary blowout preventer having a balloon-type packing unit with a central opening therein, a retrievable packing insert positioned within said opening by the engagement of a lower ring with the preventer and releaseably secured therein by hydraulically releaseable dogs latchingly engaging a latching notch in an upper ring, whereby a central rubber portion of the packing insert sealingly engages the pipe tool therethrough when the packing unit is pressurized by fluid. The blowout preventer has a fluid accumulator which absorbs the surge pressure and excess fluid to maintain a constant pressure on the packing insert as a pipe tool joint is stripped therethrough to maintain the sealing engagement between the insert and the pipe.

3,614,112

FLUID DEFLECTOR APPARATUS

Josef Herzog, Scotia, and Francis D. Ryan, Schenectady, both of N.Y., assignors to General Electric Company

Filed Feb. 14, 1969, Ser. No. 799,185
Int. Cl. F16j *15/54*
U.S. Cl. 277—19 **7 Claims**



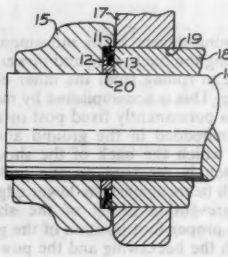
Fluid deflector apparatus of the annular type used on rotating shafts which has a perforated circumferential barrier to separate the annulus into two concentric annuli in order to slow the circumferential velocity of the deflected fluid and facilitate drainage.

3,614,113

BOOT-BELLEVILLE SEAL

Duane L. Burk, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 4, 1970, Ser. No. 16,312
Int. Cl. F16j *15/38*
U.S. Cl. 277—94 **7 Claims**



A track pin seal for the space between pin-connected track elements comprises a resilient boot encompassing the outer diameter of a pair of frustoconical springs positioned back to back and biasing the ends of the boot into sealing engagement with the respective track elements.

3,614,114

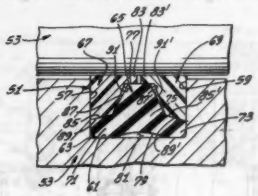
SEAL ASSEMBLY

Henry A. Traub, Pacific Palisades, Calif., assignor to W. S. Shamban & Co., West Los Angeles, Calif.

Filed July 14, 1969, Ser. No. 841,372
Int. Cl. F16j *9/00, 15/32*
U.S. Cl. 277—165 **18 Claims**

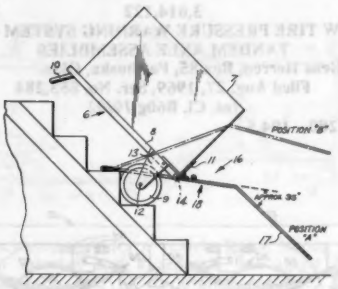
This disclosure describes a seal assembly for sealing between two relatively movable members. The seal assembly is positionable in a groove formed in one of the members and is sealingly engageable with the other of the members. The

seal assembly includes a resilient sealing ring and, in the embodiment illustrated, first and second plastic sealing rings



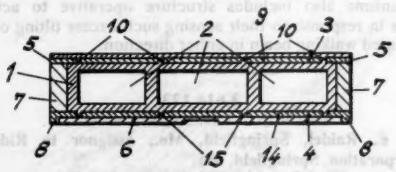
cooperable with the resilient sealing ring to form a fluidtight seal.

3,614,115
STAIR TRUCK
Malcolm F. Berglund, 4056 N. Leamington Ave., Chicago, Ill.
Filed Sept. 22, 1969, Ser. No. 859,687
Int. Cl. B62b *9/02*
U.S. Cl. 280—5.32 **1 Claim**



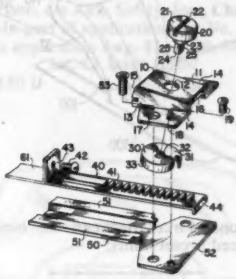
Leverage means adaptable for use in combination with a conventional type of hand truck in moving heavy objects up and down stairs with a minimum of effort.

3,614,116
SKI
Gaston Haldemann, Stansstad, Switzerland, assignor to Haldemann S.A., Geneve, Switzerland
Filed Aug. 26, 1969, Ser. No. 853,056
Claims priority, application Switzerland, Sept. 12, 1968, 13628-68
Int. Cl. A63c *5/04*
U.S. Cl. 280—11.13 L **1 Claim**



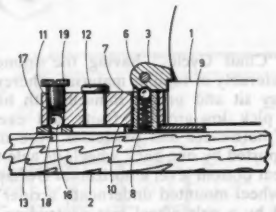
The ski core is covered with an upper and a lower metal reinforcing blade, of which the upper blade has front and rear parts with four and two longitudinal slots, respectively, and an unslotted intermediate part; and the bottom blade has front and rear parts, each with two longitudinal slots, and an unslotted intermediate part.

3,614,117
SLIDING DEVICE FOR SKI HEEL BINDING
Michio Iizuka, Tokyo, Japan, assignor to Hope Kabushiki Kaisha, Tokyo, Japan
Filed Jan. 14, 1970, Ser. No. 2,755
Claims priority, application Japan, Oct. 23, 1969, 44-100277
Int. Cl. A63c *9/00*
U.S. Cl. 280—11.35 H **4 Claims**



A sliding plate having a ski heel binding fixed at the fore end thereof and comprising tooth-shaped projections aligned at a fixed interval is moved back and forth above a base by rotating a rotary member engaged with the projections. The rotary member has a vertical sleeve so spaced that the starting point and the terminating point thereof may correspond to the interval between the projections. The rotary member is fixed to a pin through a hole of a cover which is fixed to the base; thereby each complete rotation of the pin rotates the rotary member and moves the slide plate a distance equal to the interval between the projections.

3,614,118
REAR HOLDING DEVICE FOR SKI BOOTS
Georges Pierre Joseph Salomon, 34, Avenue de Loverchy, Annecy, Haute-Savoie, France
Filed Jan. 8, 1969, Ser. No. 789,680
Claims priority, application France, Jan. 10, 1968, Dec. 20, 1968, 135,562;1094/74
Int. Cl. A63c *9/00*
U.S. Cl. 280—11.35 T **6 Claims**

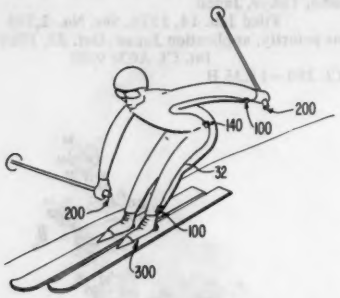


A pivotable rear holding device for a ski boot on a ski which includes a pivotable jaw for vertically holding down the heel of the boot, and a horizontally pivotable plate for supporting the heel of the boot, the pivotable jaw is mounted on the pivotable plate and follows the lateral displacement of the latter.

3,614,119
RELEASABLE SKI BINDINGS AND ACCESSORIES
John D. Wilkes, 1024 Wisconsin Ave., Washington, D.C.
Filed July 3, 1969, Ser. No. 838,873
Int. Cl. A63c *9/08*
U.S. Cl. 280—11.35 R **34 Claims**

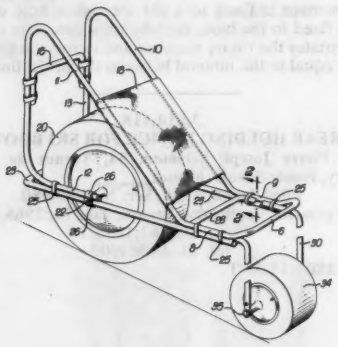
A ski binding releasing the skier's boots from the ski on command of the skier by release of mechanical switches positioned in the grips of the skier's ski poles and connected

to the ski bindings by cables in the skier's garments. A backup release system is actuated automatically when the



tension or torsional forces between the bindings and the skier's boots exceed preset limits.

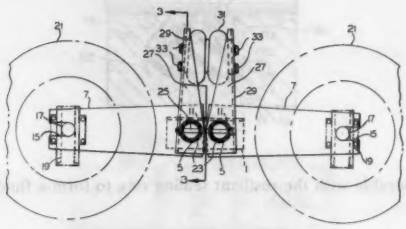
3,614,120
FARM EQUIPMENT
Frank Cicero, 217 South Berendo St., Los Angeles, Calif.
Filed May 29, 1969, Ser. No. 828,834
Int. Cl. B62m *1/00*
U.S. Cl. 280—32.5 **2 Claims**



A farm "Chair Cycle," having the frame and related supports preferably of tubular material, whereupon a worker or rider may sit and propel himself with his feet on the ground to pick low-growing fruits and even weeds and crawlers (if herbicides and pesticides were outlawed). The chair is supported by one back wheel, its axle transversing at about the seat bottom level a horizontal U-shaped frame, and by a front wheel mounted underneath a rider's knees on an axle carried by a pair wheel legs protruding from the seat bottom. The front wheel assemblage is firm, whereas the rear one should be pivotal.

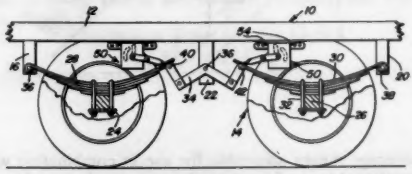
3,614,121
TANDEM AXLE SUSPENSIONS
Lloyd J. Wolf, 2425 Irving Blvd., Dallas, Tex.
Filed July 24, 1969, Ser. No. 844,325
Int. Cl. B60g *19/02, 19/08*
U.S. Cl. 280—104.5 **10 Claims**

Tandem axle suspensions comprising transversely spaced pairs of bellcranks fulcrumed on adjacent transverse axes to a vehicle frame and having platelike substantially horizontal arms extending longitudinally in opposite directions from their fulcrums, and upright arms having means resiliently biasing the upright arms away from each other through axles secured to corresponding outer ends of the horizontal arms, the horizontal arms lying in longitudinal substantially vertical planes and being torsionally sufficiently flexible to permit transverse tipping of the through axles for operation over irregular surfaces. In one embodiment of the invention, the upright arms are rigid members, with longitudinally acting



springs compressed between their upper ends, while in another embodiment the upright arms are semielliptic leaf springs rigidly secured at their lower ends to the horizontal arms and connected by a short strut to each other at their upper ends.

3,614,122
LOW TIRE PRESSURE WARNING SYSTEM FOR TANDEM AXLE ASSEMBLIES
Donald Gene Herren, Box 85, Pawhuska, Okla.
Filed Aug. 27, 1969, Ser. No. 853,284
Int. Cl. B60g *19/02*
U.S. Cl. 280—104.5 **5 Claims**

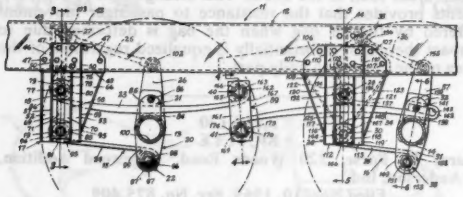


A pair of movement-sensing signal-actuating mechanism for a tandem axle assembly of the type including a walking beam supporting adjacent ends of a pair of corresponding leaf springs of the axle assembly. The mechanisms are stationarily mounted relative to the frame of the associated vehicle and include movement-sensing portions operative to sense excess tilting of the walking beam such as occurs when the wheels on one end of one of the axles of the axle assembly are overloaded in proportion to the air pressure within he tire portions of the wheels. Further, the mechanisms also includes structure operative to actuate signals in response to their sensing such excess tilting of the associated walking beam in either direction.

3,614,123
TRAILING AXLE SUSPENSION
John E. Raidel, Springfield, Mo., assignor to Ridewell Corporation, Springfield, Mo.
Filed Oct. 14, 1969, Ser. No. 866,203
Int. Cl. B60g *5/04*
U.S. Cl. 280—104.5 **12 Claims**

A suspension assembly for a vehicle having front and rear axles. Front and rear hanger assemblies depending from the vehicle chassis. A free-floating shackle assembly between the axles. A front leaf spring extending between the front hanger assembly and the shackle assembly and bearing downwardly

on the front axle. A rear leaf spring extending between the shackle assembly and the rear axle and bearing upwardly



against a bearing in the rear hanger assembly. The rear leaf spring bears downwardly against the rear axle.

3,614,124

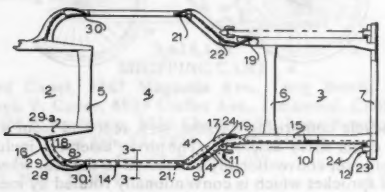
VEHICLE FRAME UNIT

Carl W. Schwabenlender, Milwaukee, Wis., assignor to A. O. Smith Corporation, Milwaukee, Wis.

Filed July 28, 1969, Ser. No. 845,383

Int. Cl. B62d 21/00

U.S. Cl. 280—106 **10 Claims**



This disclosure includes a vehicle frame having a single center rail member and a separate and single rear rail member in each side of the frame structure. The rail members are channel shaped and open in horizontally opposite directions. The members have complementing curved adjacent and telescoped ends which produce an interconnecting box section. The side rail units are interconnected to the body and to the suspension system to remove the torsion deflection from the rear rail member and as a result of shifting such force inputs, obtain the desired torsional and flexural strength in the frame.

3,614,125

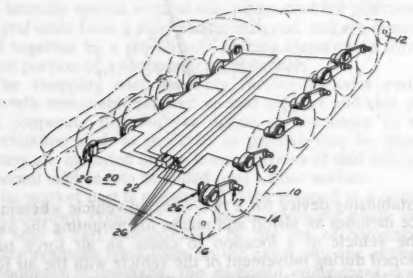
UNITIZED HIGH-MOBILITY SUSPENSION AND DRIVE SYSTEM FOR TRACK VEHICLES

Alex H. Sinclair, Southfield, and Robert J. Otto, Grosse Pointe Woods, both of Mich., assignors to The United States of America as represented by the Secretary of the Army

Filed Mar. 31, 1970, Ser. No. 24,291

Int. Cl. B60g 3/12

U.S. Cl. 280—124 **6 Claims**



A hydraulically actuated, independent roadarm suspension system wherein hydraulic fluid is supplied to any individual roadarm actuator by a hydraulic pump and reservoir contained within the roadarm. This provides vehicles, such as military tanks, with a suspension system that keeps to a minimum the requirement for interior body space for suspension components and eliminates the need for hydraulic fluid conduits within the hull.

3,614,126

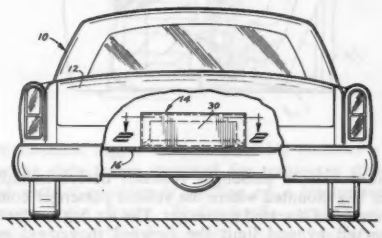
STABILIZING DEVICE FOR AUTOMOTIVE VEHICLES

Norman C. Carlson, c/o Auto Safety, Inc., Chetek, Wis.

Continuation-in-part of application Ser. No. 808,393, Mar. 19, 1969. This application Aug. 11, 1969, Ser. No. 857,267

Int. Cl. B60r 27/00

U.S. Cl. 280—150 D **24 Claims**



Apparatus for stabilizing and reducing the tendency of a vehicle to skid in response to transient forces that may be exerted upon the vehicle which consists of one or more masses adapted to be disposed upon the vehicle so that substantially universal pivotal movement of the center of gravity of the mass about a point may be realized as the vehicle is subjected to such transient forces.

3,614,127

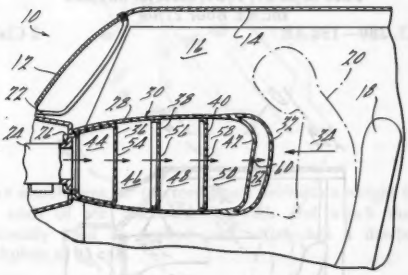
VARIABLE PRESSURE AIR BAG RESTRAINT DEVICE

Patrick M. Glance, Plymouth, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Oct. 20, 1969, Ser. No. 867,476

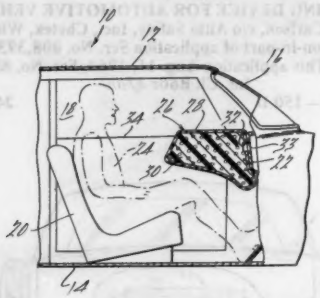
Int. Cl. B60r 21/08

U.S. Cl. 280—150 AB **3 Claims**



A variable pressure air bag restraint device adapted to be positioned in a motor vehicle passenger compartment forward of a passenger to be restrained. Remote from the passenger, the interior of the bag is connected to a source of pressurized gas capable of inflating the bag. With the bag in the inflated condition, separating walls divide the bag interior into a plurality of compartments that extend progressively between the gas source and the passenger. The compartments are interconnected by orifices in the walls. The size of each one of these orifices varies inversely with the distance between each orifice and the gas source.

3,614,128
STATIC AIR BAG RESTRAINT DEVICE
William J. Sobkow, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed Sept. 29, 1969, Ser. No. 861,853
Int. Cl. B60r 21/08
U.S. Cl. 280—150 AB 6 Claims

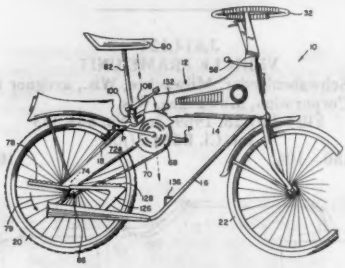


A motor vehicle passenger restraint device including a static air bag mounted within the vehicle passenger compartment forward of a seated passenger. The air bag is adapted to be impacted by and limit the forward movement of the passenger during periods of rapid vehicle deceleration. The air bag normally is inflated at atmospheric pressure and is given shape by resiliently deformable, open cell foam located within the bag. Also, the air bag normally is located vertically so that it does not interfere with the line of sight of the passenger through the vehicle windows. A first embodiment of air bag is dimensioned and is sufficiently deformable so that following an initial impact thereupon by the knees of the passenger, a portion of the bag is deformed upwardly to a position forward of the face of the passenger. According to a second embodiment of the invention, the air bag pivotally is secured to vehicle body structure near the top surface of the bag so that an initial impact upon the bag by the knees of the passenger will cause pivotal movement of the bag to a position forward of the face of the passenger.

3,614,129
VEHICLE PASSENGER RESTRAINT ARRANGEMENT INCLUDING A COMPARTMENTALIZED AIR BAG
William J. Sobkow, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed Sept. 29, 1969, Ser. No. 861,854
Int. Cl. B60r 21/04
U.S. Cl. 280—150 AB 2 Claims

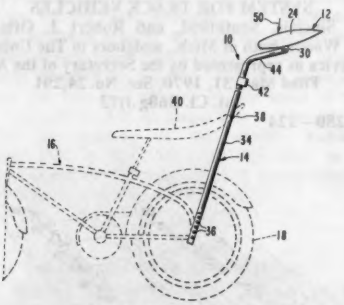
A motor vehicle passenger restraint arrangement including an air bag divided into compartments and adapted to be impacted by the body of a vehicle passenger during periods of rapid vehicle deceleration. These compartments are of various sizes with large compartments positioned to be impacted by parts of the body of the passenger having relatively large areas such as the chest. Small compartments are positioned to be impacted by body areas having relatively small areas such as the knees. This arrangement of compartments provides that the resistance to passenger movement offered by the air bag when the bag is deformed due to impact thereupon substantially is equalized regardless of the area of the impacting body part.

3,614,130
BICYCLE
Harry D. Forse, 220 Woods Road, Edgewood Addition, Anderson, Ind.
Filed Nov. 10, 1969, Ser. No. 875,409
Int. Cl. B62m 1/02
U.S. Cl. 280—261 13 Claims



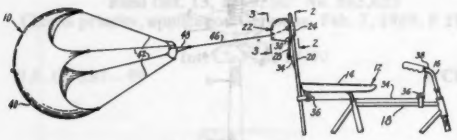
A bicycle comprising a frame, seat, rear and front wheels, and a chain drive assembly. The drive assembly includes a rear sprocket conventionally connected to the rear wheel and a front sprocket which is conventionally rotated by means of pedals. The means supporting the front sprocket and the seat are connected together so that the front sprocket and seat can be selectively and simultaneously raised and lowered. A steering wheel is provided in lieu of conventional handlebars, the steering wheel being connected to the conventional steering post by means of a universal joint.

3,614,131
AIRFOIL FOR TWO-WHEELED VEHICLE
Jack L. Lopez, P.O. Box 1061, San Carlos, Calif.
Filed Jan. 27, 1970, Ser. No. 6,183
Int. Cl. B62j 39/00
U.S. Cl. 280—289 8 Claims



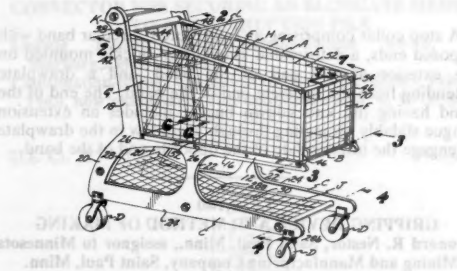
A stabilizing device for a two-wheeled vehicle wherein the device includes an airfoil and means for mounting the airfoil on the vehicle at a location to cause an air force to be developed during movement of the vehicle with the air force serving to produce a moment about the axis of rotation of one of the wheels of the vehicle, tending to rotate the latter in a predetermined direction.

3,614,132
BICYCLE PARACHUTE
Donald T. Ashworth, 15 Hammett St., Anderson, S.C.
Filed Oct. 17, 1969, Ser. No. 867,215
Int. Cl. B62j *27/00*
U.S. Cl. 280—289 1 Claim



A housing having a pivoted bottom retaining a collapsed and folded drag parachute therein. The housing is mounted near the rear of a bicycle and a remote release cord is attached to the bottom to release the parachute so that it will deploy and billow out to the rear and slow the bicycle and simulate a drag parachute used to slow a drag racer or other fast moving vehicles.

3,614,133
SHOPPING CART
Edward Ganci, 3243 Magnolia Ave., Long Beach, Calif.; Joseph V. Gance, 4823 Carfax Ave., Lakewood, Calif., and Gerald H. Anderson, 3056 Chestnut St., Long Beach, Calif.
Filed Feb. 13, 1970, Ser. No. 11,063
Int. Cl. B62b *11/00*
U.S. Cl. 280—33.99 R 4 Claims

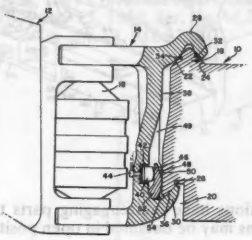


A substantially horizontal goods or grocery support and two laterally spaced vertical side pieces that are preformed as integral units from a rigid plastic material, and are removably held together by a plurality of spacing elements to form the major portion of a shopping cart assembly.

The shopping cart assembly further includes end and sidewalls removably secured to said support and side pieces and cooperate therewith to define an enclosure in which merchandise such as groceries or the like may be disposed. Casters are mounted on the lower portions of said side pieces to permit said cart to be rolled over a floor surface.

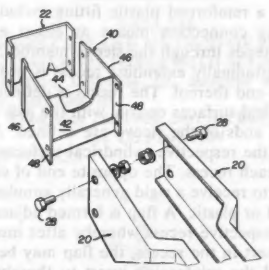
The market cart is capable of being shipped in a compact, knockeddown condition and the components easily assembled into a cart configuration by the use of conventional, readily available hand tools. In the event any one of the cart components is damaged, the damaged component is easily removed from the car assembly and replaced by a new or undamaged component, all in a minimum of time.

3,614,134
HYDRAULIC CLAMPING APPARATUS AND PIVOTAL MOUNTING FOR A SIDE SHIFTABLE MECHANICAL DIGGER SLIDE FRAME
Pierre Moriceau, Saran, and Jean Pierre Baudet, Orleans, both of France, assignors to Deere & Company, Moline, Ill.
Filed Mar. 30, 1970, Ser. No. 23,729
Claims priority, application France, Sept. 1, 1969, 6,929,784
Int. Cl. B60d *1/00*
U.S. Cl. 280—456 13 Claims



A mechanical digger support assembly includes a boom-supporting slide frame mounted for transverse sliding and limited vertical pivoting or rocking on a tractor-supported transverse main frame. Hydraulically applied clamping apparatus are provided for causing abutment surfaces on the slide frame to pivot into locking engagement with abutment surfaces on the main frame to secure the slide frame against movement at selected positions along the main frame.

3,614,135
WEIGHT BOX ATTACHMENTS FOR TRACTORS
John S. Eid, Winneconne, Wis., assignor to J. I. Case Company, Racine, Wis.
Filed Apr. 15, 1970, Ser. No. 31,050
Int. Cl. B60d *1/00*
U.S. Cl. 280—491 E 2 Claims

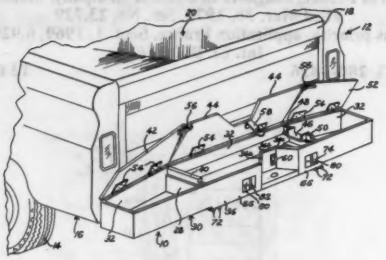


An attachment for tractors which provides a weight box at the ends of the tractor frame rails and which may be optionally used as desired and which has a dawbar or hitchplate at its end.

3,614,136
COMBINED BUMPER AND TOOL BOX
Calvin J. Dent, Klamath Falls, Oreg., assignor to David Lynn White, Sunnyvale, Calif.
Filed Dec. 9, 1969, Ser. No. 883,571
Int. Cl. B60r *19/02*; B60d *1/06*
U.S. Cl. 280—500 7 Claims

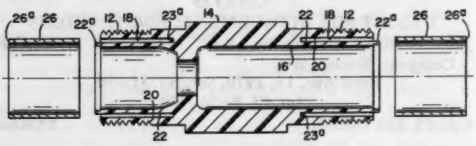
A combined bumper and tool box is provided having a rigid tray which is completely open at the top. A three section hinged cover for the tray is provided comprising a central section and two side sections. The closed central

section covers projections on the side sections so that locking the central section closed can lock all three sections closed.



The cover sections have interengaging parts through which all three sections may be detained in open positions.

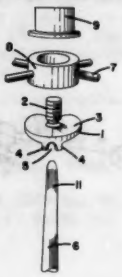
3,614,137
REINFORCED PLASTIC FITTING
Irvin D. Jacobson, Cleveland, Ohio, assignor to Perfection Corporation, Madison, Ohio
Filed Apr. 9, 1970, Ser. No. 27,021
Int. Cl. F16l *15/00*
U.S. Cl. 285—390 **5 Claims**



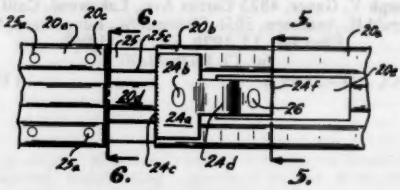
Disclosed is a reinforced plastic fitting including a sleeve member having connection means at either end. A fluid passageway extends through the sleeve member. An internal elongated longitudinally extending recess is provided in the sleeve at each end thereof. The recess is defined by radially spaced cylindrical surfaces coaxial with the axis about which the respective ends of the sleeve are defined. A radial end wall connects the respective cylindrical surfaces and defines a bottom for each recess. The opposite end of each recess is open in order to receive a rigid generally annular reinforcing insert of metal or plastic. A flap is formed adjacent the open end of each respective recess whereby after insertion of the reinforcing insert in the recess, the flap may be folded over the recess and the reinforcing insert to thereby encase the insert in the fitting end.

3,614,138
LAMP HARP SWIVEL
John Steyr, 15 Newberry Lane, Downsview, and Ernest Topler, 526 Glen Grove Rd., Toronto, Ontario, both of Canada
Filed Jan. 20, 1970, Ser. No. 4,268
Int. Cl. F16b *9/00*
U.S. Cl. 287—20.3 **9 Claims**

An improved swivel for use in mounting a lampshade on the wire frame of a lamp harp which swivel is formed of a resiliently flexible solid resinous material and comprises a base, a stud extending outwardly from one face of said base for attachment of the lampshade thereto and a channel extending across the opposite face of said base and dimensioned to accommodate the wire of said frame, the areas of said one face on opposite sides of said channel being inclined towards each other whereby pressure applied to said inclined surfaces by clamping of the lampshade on said stud releasably closes said channel into tight gripping engagement with said wire accommodated therein.

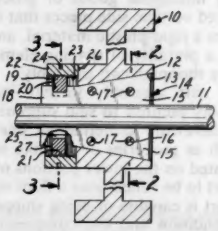


3,614,139
WELL CASING STOP COLLAR
James E. Harrison, Weatherford, Tex., assignor to Trojan, Inc., Panama
Filed June 11, 1970, Ser. No. 45,472
Int. Cl. F16d *1/06*
U.S. Cl. 287—52 **4 Claims**



A stop collar comprising an interrupted, circular band with opposed ends, a deformable knockdown buckle mounted on the exterior at one end of the band, and a drawplate extending from the opposite end of the band. The end of the band having the knockdown buckle includes an extension tongue slidably projecting through a window in the drawplate to engage the interior side of the opposite end of the band.

3,614,140
GRIPPING DEVICE AND METHOD OF MAKING
Leonard R. Nestor, Saint Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.
Filed Aug. 22, 1969, Ser. No. 852,322
Int. Cl. F16d *1/06*
U.S. Cl. 287—52.06 **11 Claims**



A gripping device useful in mounting a wheel on a shaft and for other purposes comprising a ringlike array of resiliently interconnected platelike wedge-shaped blades

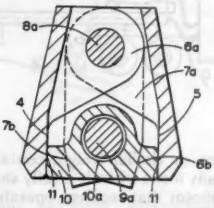
having slotted end extensions, in combination with a thrust ring for applying force to said array at said extensions and in an axial direction.

3,614,141

HINGE CONNECTIONS

Norbert Holken, and Gerhard Sprenger, both of Altlunen, Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Westfalia, Germany

Filed Oct. 13, 1969, Ser. No. 865,633
Claims priority, application Germany, Feb. 7, 1969, P 19 06 015.2
Int. Cl. F16c *11/00*
U.S. Cl. 287—99 5 Claims



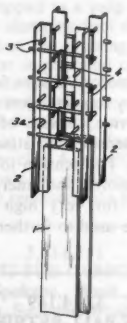
A hinge connection, especially for the interconnection of mine roof support bars, and composed of interleaved plate members having a connecting member extending through apertures therein. A recess is formed by shortening some of the plate members beneath the apertures receiving the connecting member so that an apertured pressure piece can be received in the recess. The remainder of the plate members, which are nonshortened, each have a further aperture and a further connecting member can extend through these further apertures and through the aperture in the pressure piece to rigidly lock the bars together when desired.

3,614,142

CONNECTOR FOR SECURING AN ELONGATE MEMBER TO A CONSTRUCTION PILE

Ludwig Muller, Heinrich-Heine-Strasse 44-46, 355 Marburg,Lahn, Germany

Continuation-in-part of application Ser. No. 706,083, Feb. 16, 1968, now abandoned. This application Mar. 4, 1970, Ser. No. 16,324
Int. Cl. F16b *7/00*
U.S. Cl. 287—108 7 Claims



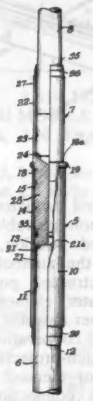
There is disclosed a connector for securing the lower end of a post such as a pylon carrying power lines to the upper end of a pile driven into the ground. The connector comprises a generally tubular structure the walls of which are formed by a latticework composed of vertical corner bars and preferably horizontal crossbars, the corner bars being fixedly secured to the pile or a metal sleeve thereon, preferably by welding. The lower part of the latticework is fitted upon and secured to the pile and the upper part constitutes a receiver for receiving therein the lower end of the post spaced apart therefrom. The resulting space is filled with concrete which thus forms a jacket for the post end reinforced by the latticework.

3,614,143

FERRULE UNIT FOR FISHING RODS AND METHOD OF CONSTRUCTION

Milton J. Stevens, 1812 Crestmont Court, Glendale, Calif.

Filed July 13, 1970, Ser. No. 54,217
Int. Cl. F16d *7/00*
U.S. Cl. 287—126 5 Claims



A ferrule unit for connecting sections of a fishing rod formed of male and female ferrules that have a telescopic interfit which is on an extremely small taper and is cushioned by an O-ring provided on the end of the male ferrule and engaged with the tapered surface of the female ferrule, and a method for producing such a ferrule unit.

3,614,144

EXPANSION CLIP AND METHOD OF INSTALLING RECESSED FIXTURES WITH SUCH CLIPS

Ralph R. Hodges, Belleville, Ill., assignor to Empire Stove Company, Belleville, Ill.

Filed May 26, 1969, Ser. No. 827,539
Int. Cl. F16b *2/04*
U.S. Cl. 287—189.35 2 Claims

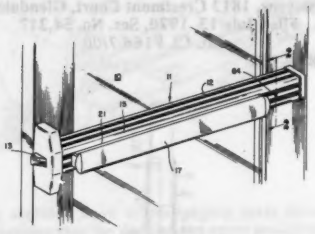
An expansion clip includes a pair of angularly related legs which intersect at a fold line and are provided with laterally turned ears at their opposite ends. The expansion clip fits at the corner formed by the intersection of a sidewall and an outwardly turned flange on a recessed fixture, and is secured to the fixture by a screw which extends through the flange and threads into the far end of the clip. When the screw is tightened, the angle between the legs decreases so that the clip transversely expands and lodges between the sidewall of the fixture and the portion of the wall construction bounding the recess into which the fixture is installed.

3,614,145

DOGGING DEVICE FOR PANIC EXIT LATCH AND ACTUATOR ASSEMBLY

George Z. Zawadzki, Indianapolis, Ind., assignor to Von Duprin, Inc., Indianapolis, Ind.

Filed Aug. 19, 1970, Ser. No. 65,201
Int. Cl. E05b *65/10*; E05c *3/16*, *15/02*
U.S. Cl. 292—92 16 Claims



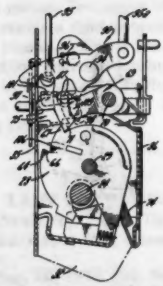
A panic exit latch and actuator assembly comprising housing means, a latchbolt movable between a projected position and a retracted position, an actuator element operatively connected to the latchbolt and arranged to move the latchbolt to its retracted position in response to movement of the actuator element, and control means including a control member movable between a first position and a second position and cooperating means for locking the actuator element in its latch-projected position. The control member and the actuator element are connected to the latchbolt by lost-motion connection means so that the latchbolt can be retracted by the control member without changing the position of the actuator element and so that the latchbolt can be retracted by the actuator element without changing the position of the control member. The said cooperating means is operated by movement of the control member to lock the actuator element against movement which, in turn, locks the panic bar against movement.

3,614,146

VEHICLE DOOR LATCH

Thomas O. Marx, Rockton, Ill., assignor to Atwood Vacuum Machine Company, Rockford, Ill.

Filed Aug. 15, 1969, Ser. No. 850,524
Int. Cl. E05c *3/06*
U.S. Cl. 292—216 9 Claims



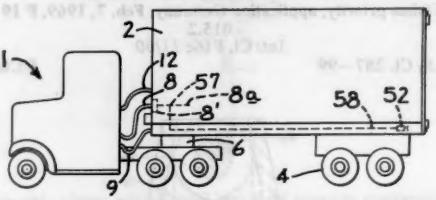
A freewheeling, dual preset vehicle door latch with a force-transmitting pin mounted for controlled floating within slots formed in a side-by-side contactor and locking lever. The latch is of the "impulse" type in that the second preset operation may be performed completely while the door is open so that the door may be closed and locked simply by being swung shut in a normal fashion.

3,614,147

SAFETY LOCK FOR TRAILER DOORS

Morris Spector, Highland Park, Ill., assignor to Sara K. Silverman, Miami Beach, Fla.

Filed July 29, 1969, Ser. No. 845,736
Int. Cl. E05c *13/04*
U.S. Cl. 292—254 5 Claims



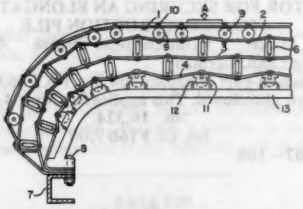
A freight trailer, or similar freight container; the door of which automatically locks when it is fully shut and is released by a pneumatic motor that receives operating power from a tractor when the trailer is coupled to a tractor. The purpose is to inhibit pilfering from the trailer when it is unattended, as for instance during piggyback rail shipment.

3,614,148

SHOCK ABSORBING VEHICLE BUFFER

Ethelbert Favary, 1246 North Laurel Ave., Los Angeles, Calif.

Filed Aug. 28, 1968, Ser. No. 756,352
Int. Cl. B60r *19/04*; B61f *19/00*; F16f *7/00*
U.S. Cl. 293—72 8 Claims



A safety device for motor vehicles for preventing damage to the vehicle and injury to passengers when in collision with other objects. The device consists of a number of strong pliable bands in great tension and attached at their opposite ends to solid supports. The tension in the bands resists the impact forces and absorbs the energy generated by the collision. In addition, for very high impact forces other means, like springs, are used to further absorb the energy of the collision.

3,614,149

COMBINED GOLF BALL RETRIEVER AND RAKE

Walter L. Clark, Fresno, Calif., assignor to Edward J. Derderian, Fresno, Calif., a part interest

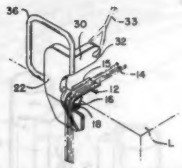
Filed Aug. 1, 1969, Ser. No. 846,775
Int. Cl. B25f *1/04*
U.S. Cl. 294—19 A 3 Claims

A combined golf ball retriever and rake having an elongated raking head provided with a golf ball receiving member and an elongated handle pivotally mounted on the

head for movement between a raking position extended in substantially right-angular relation from the head and a ball

retrieving position extended substantially longitudinally coextensively along the head.

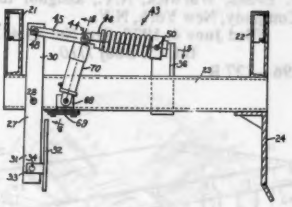
3,614,150
LIFTING HOOK
James A. Pasic, Aberdeen, Wash., assignor to Ovalstrapping, Inc., Hoquiam, Wash.
Filed May 14, 1970, Ser. No. 37,196
Int. Cl. B66c *1/34*
U.S. Cl. 294—78 R **8 Claims**



A lifting hook is provided with a hook finger engageable with a corner clip strapped to a pulp bale. Below the lifting finger the hook has a clamping foot comprising an enlarged substantially flat surface for pressing against the side of a pulp bale. A lifting ear is provided on the hook above the hook finger and extends inwardly overlying the pulp bale so that a lifting force applied to the ear will cause the clamping foot to pivot about the corner clip inwardly against the bale. A handle is secured to the hook for positioning the hook finger within the corner clip. A plurality of such lifting hooks are used simultaneously in a lifting apparatus with the clamping feet engaging opposed pulp bales.

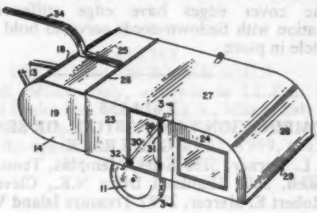
3,614,151
GRIPPING ELEMENTS FOR CARBON ANODE STACKER
Donald H. Shadle, Spokane, Wash., assignor to General Machinery Company, Spokane, Wash.
Filed Aug. 21, 1969, Ser. No. 851,814
Int. Cl. B66c *1/00*
U.S. Cl. 294—104 **4 Claims**

Gripping elements are mounted on an anode stacker for grasping carbon anode blocks and releasing the blocks at a desired location. Each of the gripping elements has a drive means for operating the gripping element. The drive means includes a toggle joint having two pivotally interconnected links in which one of the links has an adjustable length with a compression spring biasing the link to the maximum length. A hydraulic cylinder is connected to the knee of the toggle



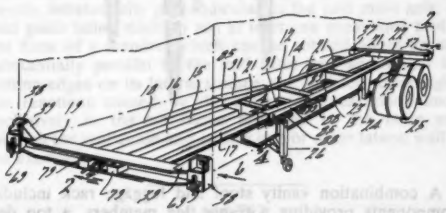
joint for straightening and bending the knee to operate the gripping element.

3,614,152
FOLDING MOBILE SHELTERS
Allan C. W. Hancock, 134 Eugenie St., St. Boniface, 6 Manitoba, Canada
Filed July 3, 1969, Ser. No. 839,013
Int. Cl. B60p *3/34*
U.S. Cl. 296—23 **4 Claims**



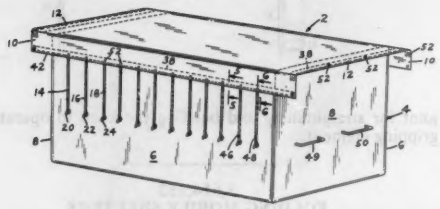
A mobile shelter wherein a portable rectangular open box is telescopically covered by an inverted open box which projects slightly therepast; one end wall of each box is free of the sides thereof at the corners, has one side hinged to its respective box and the other side hinged to the adjacent end wall of the opposite box for swinging movement of the covering box on said end walls to a position above the covered box and for enlargement of the interior of the shelter.

3,614,153
UNIVERSAL TRAILER CHASSIS
Keith W. Tantlinger, Grosse Pointe Shores, and Adam D. Sweda, Grosse Pointe Farms, both of Mich., assignors to Fruehauf Corporation, Detroit, Mich.
Filed June 2, 1969, Ser. No. 829,811
Int. Cl. B62d *27/06*
U.S. Cl. 296—35 A **9 Claims**



The universal trailer chassis is so constructed as to be able to transport containers of the tunnel and standard types when secured thereon. The container rests upon the rear chassis frame bolster and abuts the front chassis frame bolster to which it is releasably secured.

3,614,154
FLEXIBLE SHEET COVER MATERIAL FOR AN OPEN-TOPPED VEHICLE
Clarton F. Evans, Warwick, N.Y., assignor to International Paper Company, New York, N.Y.
Filed June 4, 1970, Ser. No. 43,453
Int. Cl. B60j 7/10
U.S. Cl. 296—137 R 10 Claims

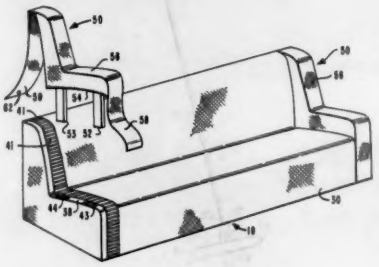


The invention pertains to a novel flexible sheet cover material for an open top vehicle. It also concerns a combination of (1) the vehicle having tiedown cleats or equivalent devices on its sides and (2) the sheet cover material. The cover edges have edge stiffeners which in combination with tiedown cords serve to hold the cover on the vehicle in place.

3,614,155
COMBINATION VANITY STOOL OR SEAT AND LUGGAGE RACK
William L. Turner, 3153 Estes, Memphis, Tenn.; William H. Campbell, 3008 Highland Drive N.E., Cleveland, Tenn., and Robert E. Mercer, 2797 Treasure Island W., Memphis, Tenn.
Filed July 7, 1969, Ser. No. 839,606
Int. Cl. A47c 13/00
U.S. Cl. 297—129 7 Claims

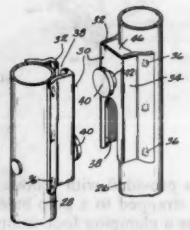
A combination vanity stool and luggage rack including components providing a frame, leg members, a top deck structure, means interconnecting the components together and the top deck structure including a main portion and auxiliary leaf portions displaceable through 180° and having cushions on one face so that in one position, the cushions are uppermost and in another position an increased luggage-supporting area is provided.

3,614,156
FURNITURE UNIT
Maynard C. Sarvas, 4773 Dogwood, Seal Beach, Calif.
Filed July 16, 1969, Ser. No. 842,162
Int. Cl. A47c 31/10
U.S. Cl. 297—224 10 Claims



Furniture units having readily detachable but permanent appearing covers incorporate a single principal cover element which is tautened in two mutually orthogonal directions by means including interior elastic webbing members disposed along planes transverse to the length of the furniture unit. The elastic members are in turn concealed by arm members which may comprise a combination of padding, retention means and cover.

3,614,157
GANGING ATTACHMENT FOR FOLDING CHAIRS
Philip J. Hendrickson, and Richard J. Resch, both of Green Bay, Wis., assignors to Krueger Metal Products, Inc., Green Bay, Wis.
Filed June 23, 1969, Ser. No. 835,569
Int. Cl. A47c 15/00
U.S. Cl. 297—248 2 Claims

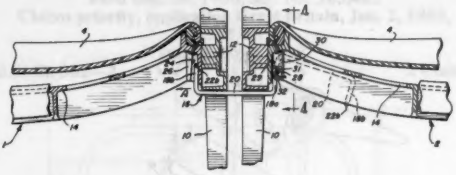


Identical fittings are attached in mutually inverted positions at vertically spaced points on the legs of folding chairs, each fitting being channel-shaped with its flanges welded to the leg and having its web provided with a headed stud at one end and a slot at the other. Relative vertical movement between the chairs so equipped will engage the slotted ends of the respective fittings of one chair with the projecting studs of the adjacent chair, thus interlocking the chairs against lateral separation.

3,614,158
CHAIR GANGING DEVICE
Robert G. Mohr, Portage, Mich., assignor to Tiffany Industries Inc., Clayton, Mo.
Filed Dec. 5, 1969, Ser. No. 882,653
Int. Cl. A47c 1/124
U.S. Cl. 297—248 3 Claims

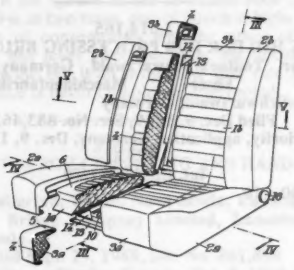
A ganging device for interconnecting chairs and the like into rows, including a ganging member mounted beneath the chair on the underside of the seat portion thereof and swingable approximately 180° between a retracted position

beneath the chair seat and an extended position for securement to an adjacent chair. The ganging member has self-contained resilient means which cooperates with a



portion of the chair to provide a toggle arrangement to urge and hold the ganging member in either its retracted or extended position.

3,614,159
SEAT CUSHION
Georges Christin, Marnes-La-Coquette, France, assignor to Etablissments Bertrand Faure, Puteaux, France
Filed Feb. 26, 1969, Ser. No. 802,601
Claims priority, application France, Feb. 27, 1968, 141452
Int. Cl. A47c *3/00, 7/14;* **B60n** *1/06*
U.S. Cl. 297—452 **7 Claims**



The seat cushion comprises a central slab of cellular material having marginal zones, and two side members of cellular material each having a projecting edge portion with a free extremity, the projecting edge portion of each said side member covering a respective marginal zone of said central slab and said cellular material of said central slab being of greater resiliency than said cellular material of said side members.

3,614,160
DEVICE FOR BRACING A DRIVING MACHINE WITH RESPECT TO A SHAFT OR TUNNEL WALL
Gerd Kampf-Emden, Hosel; Heinz Horst, Rheinhausen, and Friedrich Wilhelm Klapdohr, Rheinhausen, all of Germany, assignors to Demag Aktiengesellschaft, Duisburg, Germany
Filed Oct. 31, 1969, Ser. No. 873,006
Claims priority, application Germany, Nov. 9, 1968, P 18 07 970.4
Int. Cl. E21c *29/02;* **E01g** *3/04*
U.S. Cl. 299—1 **8 Claims**

A device for bracing a tunnel-driving machine with respect to the shaft or tunnel which is being formed includes a central drive machine shaft around which is mounted a carrier sleeve with a plurality of radially extending and circumferentially spaced support assemblies. Each support assembly includes a bracing claw or engaging plate which is universally pivotally mounted on a spherical socket of a radially extending support guide or cylindrical member. A plurality of holding springs engaged around the periphery of the plate are anchored at their opposite ends to the support guide and tend to urge the plate into a central position in respect to its universal centrally arranged socket support. Each support member carrying the supporting socket for the

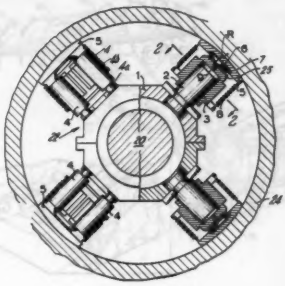
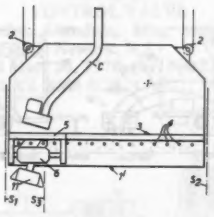


plate may be shifted radially outwardly in respect to the associated support by means of a fluid piston and cylinder combination.

3,614,161
TRENCHING IN ROCKY SOILS
Giosue Miotti, Milan, Italy, assignor to I.C.D.S. Impresa Costruzioni Opere Specializzate S.p.A., Milan, Italy
Filed Aug. 15, 1969, Ser. No. 850,365
Claims priority, application Italy, May 31, 1969, 17626A/69
Int. Cl. E21c *37/00*
U.S. Cl. 299—10 **12 Claims**

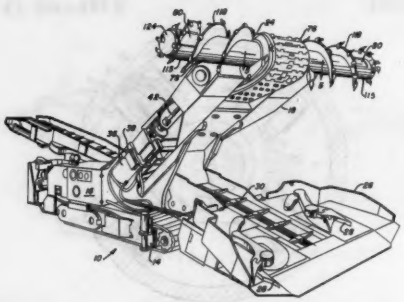


A method and apparatus for the excavation of trenches, more especially for the subsequent construction of subterranean walls, diaphragms or bulkheads, of the type in which an excavating device is caused to advance along a main axis of excavation, comprising a guide of the said device, substantially perpendicular to the said main axis, on said guide being made to run at least one excavating tool in the form of a mandrel which can be rotated about an axis substantially parallel to the said main axis and which has cutting edges on its lateral surface, the said tool discharging the reactions caused by the action of excavation almost exclusively in the transverse direction to the main axis through the said guide and against one or other lateral wall of the excavation.

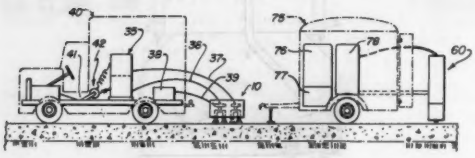
3,614,162
MINING-MACHINE CUTTING STRUCTURE
George R. Teeter, 111 Glenview Ave., Oil City, Pa.
Filed Dec. 24, 1968, Ser. No. 786,650
Int. Cl. E21c *25/06, 35/20*
U.S. Cl. 299—67 **17 Claims**

A mining-machine cutting structure and more particularly

a mining head having cutting means consisting of a single centrally located cutter supporting chain and cutter-supporting rotary elements extending outwardly from the sides of the cutting chain.



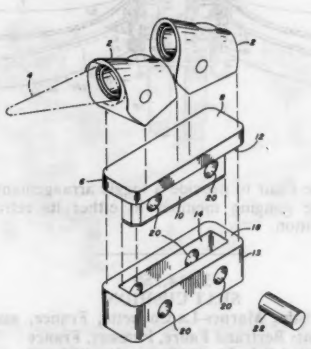
3,614,163
LOW NOISE PROCESS FOR BREAKING PAVEMENT WHICH RELIES UPON REFLECTED TENSILE PULSES TO FRACTURE THE PAVEMENT
Philip J. Anderson, Deerfield, Ill., assignor to Institute of Gas Technology, Chicago, Ill.
Filed July 30, 1969, Ser. No. 846,032
Int. Cl. E01c *23/09*
U.S. Cl. 299—14 **8 Claims**



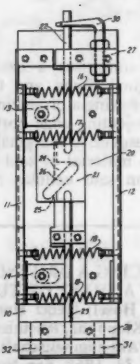
A method for breaking pavement which, in general, includes the steps of creating a continuous or discontinuous free boundary surface about and defining the area of the surface to be broken or fragmented, and then imparting to this defined area high intensity, short duration compressive wave pulses of such number, location and intensity that these compressive waves when reflected at the free surface as tensile wave pulses will exceed the tensile strength of the pavement and cause the latter to break up so as to produce fragments of a desired size for subsequent removal.

3,614,164
MINE TOOL ADAPTER
Charles S. Davis, Benton, Ill., assignor to The Carmet Company, Pittsburgh, Pa.
Filed Aug. 1, 1969, Ser. No. 846,785
Int. Cl. E21c *25/46, 35/18*
U.S. Cl. 299—83 **11 Claims**

An adapter for mounting a mine tool cutting bit and its holding block on a powered head or chain driven by a mining machine, including a block adapter having a base portion adapted to be affixed to the holding block and a projection extending substantially perpendicularly therefrom. A receptacle portion adapted to be affixed to the powered head or chain of the mining machine has a recess adapted to closely receive the projection extending from the base portion of the block adapter and a shoulder portion upon which the base portion surrounding the projection rests.

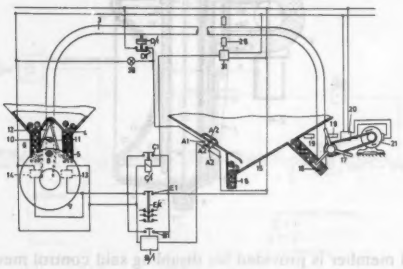


3,614,165
A WORK HOLDER FOR PROCESSING BRUSH BODIES
Willi Ebser, Todtnau/Schwarzwald, Germany, assignor to Gottlieb Ebser Maschinenfabrik K.G., Todtnau/Schwarzwald, Germany
Filed Dec. 9, 1969, Ser. No. 883,463
Claims priority, application Germany, Dec. 9, 1968, P 18 13 473.1
Int. Cl. B25b *1/20*
U.S. Cl. 300—10 **15 Claims**



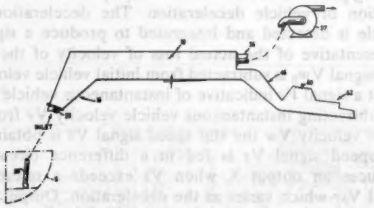
The individual brush body is held within a work holder having cutouts which are gripped for purposes of transporting the work holder between stations. The work holder has at least one movable wall which is caused to bear against the brush body held therein. A rotatable bolt member is actuated for purposes of opening and closing the work holder by moving the movable wall. Supporting blocks and spring brackets within the work holder support and locate precisely the work while being processed at the work stations.

3,614,166
ARTICLE-FEEDING SYSTEM
Wolfgang Spitz, Dassendorf, Germany, assignor to Tobacco Research and Development Institute Limited, Zug, Switzerland
Filed Dec. 20, 1968, Ser. No. 785,463
Claims priority, application Great Britain, Jan. 2, 1968, 305/68
Int. Cl. B65g 53/00
U.S. Cl. 302—2 2 Claims



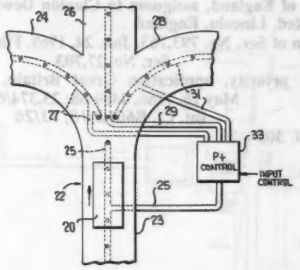
The invention is concerned with a pneumatic conveyance system in which rod-shaped articles such as filter rods are dispatched into a pipeline at a point of supply, pneumatically conveyed to a point of consumption, extracted from the pipeline and fed to a storage bin from which consumption takes place. In the system of the invention rods can be fed into the pipeline at two rates, one of which is higher than the expected rate of consumption and the other of which is lower. If the bin level goes too high, the second rate is applied and if the bin level drops, the first rate is applied. Thus conveyance is never completely interrupted.

3,614,167
APPARATUS FOR CONVEYING AND HANDLING ARTICLES
William C. Patterson, Canso, Nova Scotia, Canada, assignor to Atlantic Bridge Company Limited, Lunenburg, Nova Scotia, Canada
Filed Sept. 29, 1969, Ser. No. 861,890
Claims priority, application Canada, Oct. 8, 1968, 031,923
Int. Cl. B65g 53/30
U.S. Cl. 302—14 18 Claims



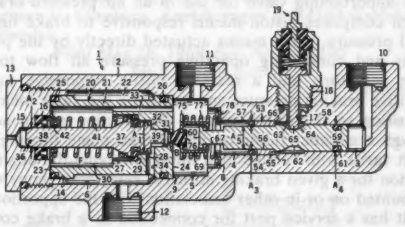
An apparatus for conveying and handling somewhat delicate objects, such as fish, which includes an elongated generally horizontally disposed chamber the interior of which is connected to the intake of a suction fan. An elongated intake pipe is connected to one end of the elongated chamber and an exit chute is connected to the opposite end of the chamber. The exit chute includes a water trap therein to permit passage of articles therethrough while preventing entry of air into the chamber. The subatmospheric pressure created within the chamber by the suction fan arrangement causes air to flow rapidly through the intake pipe to carry the articles therethrough into the interior of the chamber where they are decelerated prior to passing into the exit chute. The device is provided to flow a stream of water longitudinally of the chamber from the end connected to the intake pipe to the other end which is connected to the exit chute thereby to assist in decelerating the articles while assisting in preventing damage thereto.

3,614,168
BERNOULLI CONVEYOR
Richard J. Range, Silver Spring, Md., assignor to Bowles Fluidics Corporation, Silver Spring, Md.
Filed Sept. 30, 1969, Ser. No. 862,287
Int. Cl. B65g 53/04
U.S. Cl. 302—31 11 Claims



An improved Bernoulli conveyor comprises an endless belt supported above and propelled along a surface by angled airjets issuing from ports which are formed in the surface and define a path for the belt. In a further improvement, a plurality of paths are so defined, the ports in each path communicating with respective manifolds which are selectively pressurized to switch the path of the belt. A similar switching technique is employed for individual documents supported above and propelled along selectable paths on a surface without a belt. Additionally, an improved port configuration is disclosed for issuing the angled jets wherein the port wall flares outwardly in the conveyor surface so as to permit the Coanda phenomenon to cause the jet to issue along the surface, thereby increasing the propelling component of the angled jet.

3,614,169
CONTROL VALVE
Richard C. Bueler, Glendale, Mo., assignor to Wagner Electric Corporation, Newark, N.J.
Filed Mar. 26, 1970, Ser. No. 22,904
Int. Cl. B60t 8/26, 15/00, 17/22
U.S. Cl. 303—6 C 7 Claims



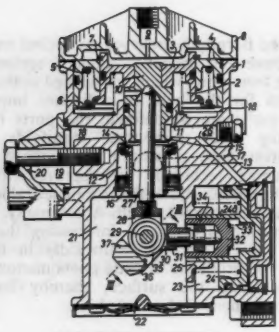
A control valve for use in a dual or split brake system having a shuttle or warning piston movable from a centered position to opposed translated positions to energize a driver-warning lamp in response to a predetermined differential between separate supplied fluid pressures acting thereon. A divider member is provided in the control valve defining a flow passage therethrough for one of the supplied fluid pressures, and a proportioning valve is movable in said flow passage to control the application therethrough of the one supplied fluid pressure. A bypass passage for subjection to the one supplied fluid pressure is also provided in the divider member connected with the flow passage in bypass relation with the proportioning valve, and a valve member is normally urged into engagement with the divider member closing the bypass passage. A lost motion connection is provided between the valve member and the shuttle piston wherein

said valve member is moved to a position opening the bypass passage upon the movement of said shuttle piston to one of its translated positions.

3,614,170
APPORTIONING VALVES FOR BRAKE SYSTEMS

Wilbur Mills Page, London, and Ralph Coupland, Lincoln, both of England, assignors to Clayton Dewandre Company Limited, Lincoln, England

Division of Ser. No. 793,763, Jan. 24, 1969. Filed Apr. 13, 1970, Ser. No. 27,703
Claims priority, application Great Britain, Jan. 29, 1968; May 16, 1968, 4489/68; 23,374/68
Int. Cl. B60t *8/18, 13/26*
U.S. Cl. 303—7 5 Claims



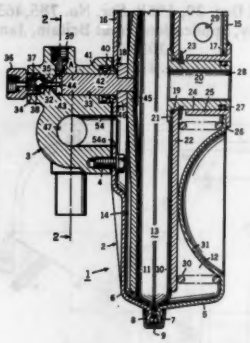
An apportioning valve for use in an air pressure braking system comprises piston means responsive to brake line or signal pressure, valve means actuated directly by the piston means and controlling operative pressure air flow to the brake actuators, and a reaction piston responsive to the operative braking pressure and acting on the valve means in opposition to the piston means, the reaction piston acting through a member riding on an inclined plane the angle of which varies with vehicle load thereby varying the degree of reaction for a given braking effort. A relay emergency valve is mounted on or in other association with the apportioning, and it has a service port for connection to a brake control line and an emergency port for connecting to a tractor reservoir, both ports leading to the signal pressure side of the apportioning valve.

3,614,171
ANTISKID MECHANISM

John A. Machek, St. Louis, Mo., assignor to Wagner Electric Corporation, Newark, N.J.

Division of Ser. No. 825,087, May 8, 1967, Pat. No. 3,556,466. Filed Aug. 21, 1970, Ser. No. 66,026
Int. Cl. B60t *17/18, 8/02*
U.S. Cl. 303—21 AF 11 Claims

An antiskid device is provided with a control valve actuated in response to signals from a sensing mechanism of impending vehicle skid conditions to respectively subject a control member to atmosphere and selectively subject said control member to vacuum for controlling the application of supplied fluid pressure to the vehicle brakes, and a resiliently

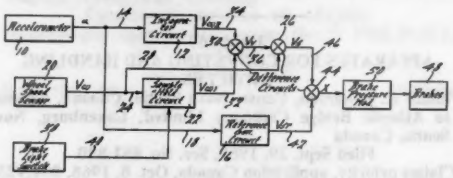


urged member is provided for disabling said control member in the event the vacuum is lost.

3,614,172
SKID CONTROL SYSTEM

Hugh E. Riordan, Ann Arbor, Mich., assignor to Kelsey-Hayes Company, Romulus, Mich.

Filed Feb. 27, 1969, Ser. No. 802,992
Int. Cl. B60t *8/08*
U.S. Cl. 303—21 BE 10 Claims



A skid control system for a wheeled vehicle varies the braking pressure as a function of slip speed which varies as a function of vehicle deceleration. The deceleration of the vehicle is detected and integrated to produce a signal Vw_2 representative of the actual loss of velocity of the vehicle. This signal Vw_2 is subtracted from initial vehicle velocity Vw_1 to get a signal Vv indicative of instantaneous vehicle velocity. By subtracting instantaneous vehicle velocity Vv from linear wheel velocity Vw the slip speed signal Vs is obtained. The slip speed signal Vs is fed to a difference circuit which produces an output X when Vs exceeds a reference slip signal Vsr which varies as the deceleration. Output signal X causes actuation of a modulator to relieve brake pressure.

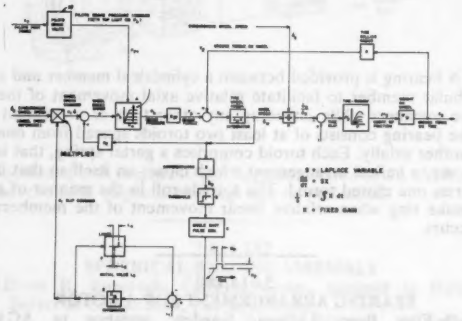
3,614,173
SLIP COMMAND SKID CONTROL

Orland D. Branson, Sunland, Calif., assignor to The Bendix Corporation

Filed June 27, 1969, Ser. No. 837,067
Int. Cl. B60t *8/10*
U.S. Cl. 303—21 P 20 Claims

A skid control system is described which modifies an operator's brake pressure request in such manner as to deliver maximum braking effectiveness by continuously searching the roadway surface condition to determine the percentage of tire slip at which maximum braking occurs and to modulate the brake pressure such that the percent tire slip is forced into the region resulting in maximum braking. An electrical wheel speed signal is generated in each braked wheel in which frequency varies with speed, and these signals

are compared so that the fastest rotating wheel on one side of the braked vehicle is used, along with a time constant or delay circuit means to provide a wheel speed reference. The system will also operate with a single braked wheel. This reference is combined with a slip command signal to produce a wheel speed error signal. A small amount of the integral of this wheel speed error is added to itself, and the sum is supplied to a servovalve which may modify the operator's brake pressure command. When any of the wheels experiences a deceleration greater than a threshold value,



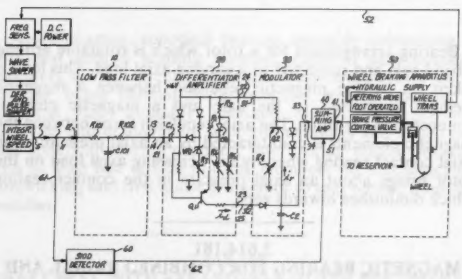
indicating the point of maximum braking has been passed, an output pulse is provided which effectively reduces the slip command signal (percent slip) to force the slip back to slightly below the maximum braking point. The percent slip command is slowly increased at a fixed rate until the cycle is repeated, thus continuously locating the point of maximum braking point. The percent slip command is slowly increased at a fixed rate until the cycle is repeated, thus continuously locating the point of maximum braking and keeping the system in this region.

3,614,174

ANTISKID CONTROL SYSTEM

Ervin G. Romero, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed July 22, 1969, Ser. No. 843,569
Int. Cl. B60t *8/12*
U.S. Cl. 303—21 CG **7 Claims**



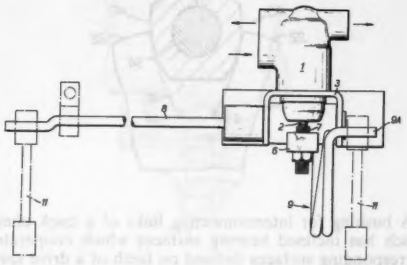
An antiskid control system for controlling a wheel being braked which includes circuits for causing the system to respond continuously to overtorqued conditions of the wheel previous to the occurrence of larger torque imbalance conditions indicative of skid conditions. The system comprises a novel combination of circuitry, including a wheel driven generator, a differentiator circuit including an amplifier, and modulator circuits for providing a modulated valve control signal for causing a decrease or increase of applied braking effort to the wheel being braked as a function of the deceleration rate of the wheel.

3,614,175

VEHICLE BRAKING SYSTEMS

Thomas G. Lawson, Tyseley, Birmingham, England, assignor to Girling Limited, Tyseley, Birmingham, England

Filed Feb. 18, 1969, Ser. No. 800,092
Claims priority, application Great Britain, Feb. 21, 1968, 8491/68
Int. Cl. B60t *8/18*
U.S. Cl. 303—22 R **4 Claims**



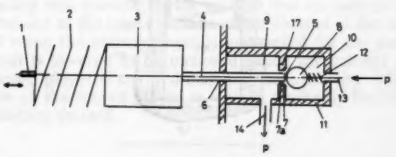
The invention relates to pressure control arrangements for hydraulic brake systems on vehicles having an independent suspension for the front and/or rear wheels. The invention resides in an arrangement in which a pressure control valve (which may be an intensifying, reducing or pressure-limiting valve) and a control linkage for transmitting a force corresponding to vehicle loading to the valve for altering the cutoff pressure thereof, wherein the valve is loaded by separate spring means coupled to respective independently sprung wheel assemblies on opposite sides of the vehicle, the loadings imposed by the respective springs being additive in their control effect upon the valve. Thus, the linkage serves to average out the effects of different deflections of the sprung wheel masses on opposite sides of the vehicle and at the same time avoids the expense and characteristic difficulties involved in having two separate control valves controlled by deflections on the respective sprung wheel assemblies to which they are subject.

3,614,176

BRAKE CONTROL FOR PREVENTING LOCKING DURING THE BRAKING OF A ROTATING WHEEL

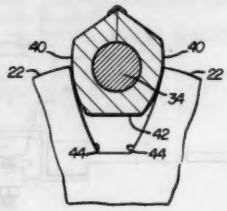
Jan-Olov M. Holst, Laduvagen 12, 75247 Uppsala; Rolf E. Nordstrom, Johan Enbergsvag 48A, 17161 Solna, and Christer U. Ekenberg, Apoteksvagen 6, 74100 Knivsta, all of Sweden

Filed May 20, 1969, Ser. No. 826,180
Int. Cl. B60t *8/06*
U.S. Cl. 303—61 **19 Claims**



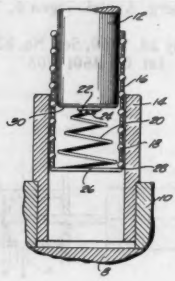
The combination, with a rotatable wheel and fluid-pressure-actuated brake for braking rotation of the wheel, of a mechanical control for preventing the wheel from locking during braking in which a frequency sensitive driven vibrating system having a predetermined resonant frequency is forced to vibrate at frequencies proportional to the rotational speed of the wheel and wherein displacement of one component of the vibrating system through a predetermined amplitude during forced vibration thereof at the predetermined resonant frequency actuates a fluid flow control for precluding increase in braking effect exerted on the wheel.

3,614,177
CHAIN BUSHING AND METHOD OF MAKING SAME
Kenneth L. Magee, and John F. Wilson, both of Racine, Wis., assignors to J. I. Case Company, Racine, Wis.
Filed June 6, 1969, Ser. No. 831,027
Int. Cl. B62d *55/08*
U.S. Cl. 305—57 4 Claims



A bushing for interconnecting links of a track chain and which has inclined bearing surfaces which cooperate with corresponding surfaces defined on teeth of a drive sprocket. The bushing is formed from a blank having a first wall defined by a partially developed surface capable of defining the wall of a circular aperture in its final configuration and defined between opposite ends. The blank also includes a second opposed wall having spaced arcuate surfaces interconnected by an intermediate recessed area. The blank is deformed, as by rolling, to reposition the partially developed surface to define the wall of a circular opening and locate the surfaces angularly with respect to each other and parallel to the axis of the opening or aperture. The ends of the first wall are interconnected and the blank cut into sections with the opposite ends subsequently operated upon to produce circular hubs surrounding the opening on opposite ends of each section.

3,614,178
BALL BEARING FOR DIE SET LEADER PIN
Richard R. Stamm, Brookfield, Wis., assignor to Superior Die Set Corporation, Oak Creek, Wis.
Filed Jan. 20, 1970, Ser. No. 4,317
Int. Cl. F16c *29/00*
U.S. Cl. 308—4 C 3 Claims

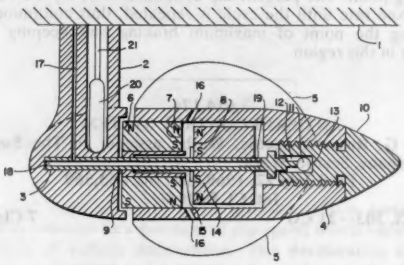


A cage intervening between a leader pin and bushing in a die set is provided with ball bearings which guide the leader pin. As the leader pin moves in the bushing, the bearings roll between the leader pin and bushing, and the cage is caused to advance in a corresponding direction at half the rate of the leader pin. A spiral coiled spring fixed to the leader pin has its lowermost coil closely fitted within the bushing at substantially the radius of the cage where it can collapse under the leader pin in the lowest position thereof. At full length it supports the cage in elevated leader pin positions such that the cage might otherwise be released to depart from the desired relationship between the relatively movable parts.

3,614,179
BEARING CONSTRUCTION
James C. Hosken, 15 Hobart Terrace, Newton Centre, Mass.
Filed Oct. 1, 1969, Ser. No. 862,890
Int. Cl. F16c *19/00, 29/00*
U.S. Cl. 308—6 R 3 Claims

A bearing is provided between a cylindrical member and a tubular member to facilitate relative axial movement of the two members while impeding any other type of movement. The bearing consists of at least two toroids spaced from one another axially. Each toroid comprises a garter spring, that is to say, a helical arrangement which closes on itself so that it forms one closed toroid. The toroids roll in the manner of a smoke ring when relative linear movement of the members occurs.

3,614,180
BEARING ARRANGEMENT FOR A ROTOR
Palle-Finn Beer, Lidingo, Sweden, assignor to AGA Aktiebolag, Lidingo, Sweden
Filed Mar. 18, 1970, Ser. No. 20,633
Claims priority, application Sweden, Mar. 19, 1969, 3785/69
Int. Cl. F16c *39/06*
U.S. Cl. 308—10 7 Claims

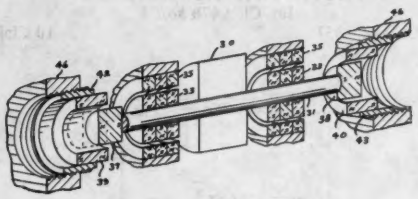


Bearing arrangement for a rotor which is rotatable around a fixed axle and subjected to a varying axial load. This load is taken up by the magnetic repulsion between a magnetic element connected to the axle and a magnetic element connected to the rotor. The axial repulsion force between the magnetic elements is counteracted by an axial pressure in an axial contact seating whereby an increasing axial load on the rotor brings about an axial pressure in the contact seating which diminishes towards zero.

3,614,181
MAGNETIC BEARING FOR COMBINED RADIAL AND THRUST LOADS
Crawford R. Meeks, Granada Hills, Calif., assignor to The United States of America as represented by the Secretary of the Air Force
Filed July 2, 1970, Ser. No. 51,789
Int. Cl. F16c *39/06*
U.S. Cl. 308—10 3 Claims

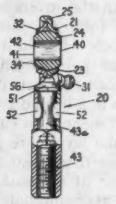
A combined radial and thrust magnetic bearing system having a shaft with a plurality of radially polarized magnets secured to the shaft. The radially polarized magnets being positioned within a plurality of corresponding magnets polarized radially opposite to the magnets on the shaft. A pair of axially polarized magnets are also secured to the

shaft. The axially polarized magnets being positioned within annular axially polarized magnets which are adjustably



positioned with respect to the magnets secured to the shaft so that the axial magnetic bearings may be preloaded.

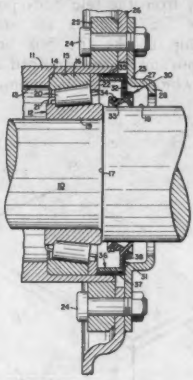
3,614,182
SPHERICAL BEARING ASSEMBLY
Alfreds R. Rozentals, Fairfield, Conn., assignor to Heim Universal Corporation, Fairfield, Conn.
Filed Dec. 22, 1969, Ser. No. 887,217
Int. Cl. F16c *9/04*
U.S. Cl. 308—72 8 Claims



A self-aligning, spherical bearing assembly comprising a first and second housing member, each of said housing members having circular openings therethrough with each opening being defined by a spherical seating portion, a spherical ball rotatably enclosed within said housing members and in alignment with said openings and seated on said spherical seating portions, interlocking means integral with at least one of said housing members for mechanically interlocking said first housing member to said second housing member.

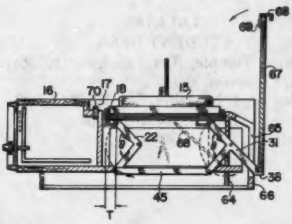
3,614,183
SHAFT SEAL WITH EXPANDABLE OUTER PERIPHERY
Alfred S. Berens, Farmington; Dean R. Bainard, Novi, and George L. Corsi, Southfield, all of Mich., assignors to Federal-Mogul Corporation, Southfield, Mich.
Filed Feb. 19, 1970, Ser. No. 12,563
Int. Cl. F16c *33/76*
U.S. Cl. 308—187.1 21 Claims

A rigid reinforcing member has a cylindrical portion slip-fitting in the bore and an inwardly extending radial flange. An elastomeric sealing lip is supported for shaft contact by the radial flange while a cylindrical flexing gasket is supported by the cylindrical portion and extends beyond it. A separate rigid ring slip-fits inside the rigid reinforcing member and engages the flexing gasket. When force is exerted axially against the radial flange in one direction and



against the separate ring in the other, the gasket is forced out into sealing engagement with the bore wall.

3,614,184
RECORD PLAYER
Yasuro Yawata, and Nobuhiro Nakae, both of Tokyo, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Feb. 12, 1969, Ser. No. 798,592
Claims priority, application Japan, Apr. 26, 1968, 35,293/68
Int. Cl. A47b *81/06*
U.S. Cl. 312—8 4 Claims

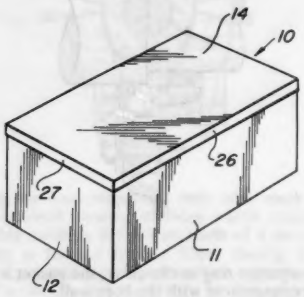


A record player in which a turntable, a pickup, a phonomotor driving said parts, etc. are combined into a unit and the cover thereof is opened or closed in conjunction with the raising and lowering of the unit, so that the unit is raised to come out of the upper surface of the cabinet of the record player when the record player is uncovered for use and the said unit is lowered to be enclosed inside the cabinet when the record player is covered and not used, thereby reducing the size of the record player as well as markedly facilitating the handling thereof.

3,614,185
FILE BOX AND FILE SUSPENSION DEVICE THEREFOR
Robert E. Splan, 730 Waikiki Drive, Des Plaines, Ill.
Filed July 2, 1969, Ser. No. 838,538
Int. Cl. A47b *63/00*
U.S. Cl. 312—184 4 Claims

A file box and flexible, resilient suspension device therefor in which the flexible, resilient suspension device includes a body portion which is disposed adjacent the inner surface of a sidewall of the file box and has flexible, resilient clamping means at its upper end which extends laterally from the said body portion at the outer side thereof and is removably mounted in clamping engagement on and with the upper end portion of a sidewall of the file box. The body of the flexible

suspension device extends from end to end of the sidewall of the file box and has file-supporting means in the form of an inturned supporting arm or flange at its lower end and extending laterally from the said body portion on the inner side thereof. The file members are arranged in vertical parallel relationship in the file box and are removably supported by supporting means arranged at the ends of each file member and which rest on the supporting means at the

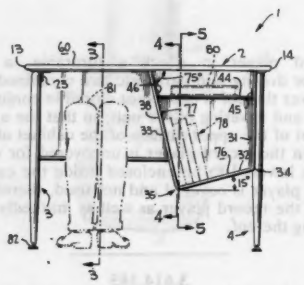


lower end of the suspension device. The construction of the file box and of the said flexible, resilient suspension device therefor are such that the file box may be closed by means of the cover or lid therefor and the file boxes stacked one upon another without interfering with or damaging or impinging upon the files in the file boxes or the said flexible, resilient suspension devices therefor.

3,614,186
STUDENT DESK

Roy E. Jennings, Temple, Tex., assignor to Royal Seating Corporation, Cameron, Tex.

Filed Sept. 24, 1969, Ser. No. 860,509
Int. Cl. A47b *17/00*
U.S. Cl. 312—194 **14 Claims**

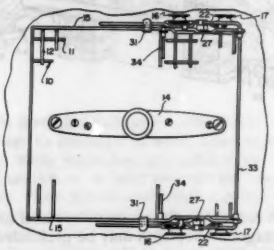


A student desk having a horizontal top, leg structures at each side of the top, and a book box offset toward one side of and below the top. The book box has a sidewall and lower wall inclined from horizontal in the same direction to support books in both a standup or laydown position. The book box is secured to the top and to the leg structure at one side of the desk, a modesty panel is secured to the book box and the leg structure at the other side of the desk, and the book box and panel strengthen the leg structures.

3,614,187
APPARATUS FOR SUPPORTING ARTICLES IN A DISHWASHER

Victor W. Cuthbert, Sodus, Mich., assignor to Whirlpool Corporation

Filed Feb. 10, 1970, Ser. No. 10,252
Int. Cl. A47b *88/04*
U.S. Cl. 312—351 **10 Claims**

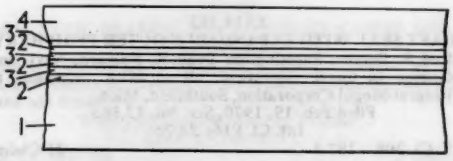


A wheeled basket for supporting articles in a dishwasher so that the basket rolls on a horizontal track and can be pulled out for loading and unloading and can be pushed into the dishwasher for the washing operation in which a pair of wheels is located on each side of the basket and with each pair of wheels being vertically spaced to engage opposite sides of a supporting guide track that forms a part of the dishwasher, a pair of levers each movable about a fulcrum on the basket at a lateral side with each lever rotatably carrying a wheel spaced from the corresponding fulcrum, a linkage of fixed length interconnecting the levers at areas spaced from the fulcrums and with the levers being movable in vertical planes about their fulcrums for changing the vertical elevation of the wheels while still maintaining the vertical spacing between each pair of wheels. The invention also includes multiple spaced retainers on each side of the basket for holding the levers in adjusted position so that the vertical spacing of the pair of wheels on each side of the basket will be maintained until the levers are changed to a new setting. This varying of the vertical positions of the pair of wheels regulates the elevation of the basket in the dishwasher and permits the basket to accommodate articles of various height.

3,614,188
CESIUM IODIDE INTERFERENCE FILTER WITH MOISTURE RESISTANT LAYER

John Scott Seeley, 1 Churchill Crescent, Sonning Common, Reading; Stanley Desmond Smith, 21, Simon's Lane, Wokingham, Reading, and Frederick Stafford Ritchie, Walkergate, Newcastle upon Tyne 6, all of England

Filed Sept. 16, 1969, Ser. No. 858,302
Claims priority, application Great Britain, Oct. 23, 1968, 50,381
Int. Cl. G02b *5/28*
U.S. Cl. 350—1 **4 Claims**

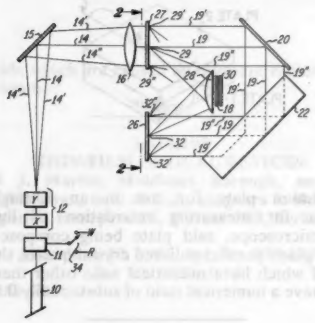


An interference multilayer filter for use with infrared radiation comprising a system of alternating layers of materials having different refractive indices deposited on a substrate at least some of the layers being of cesium iodide.

3,614,189
HOLOGRAPHIC MEMORY WITH ILLUMINATION HOLOGRAM PROVIDING REFERENCE AND OBJECT BEAMS

Wilber Clarence Stewart, Highstown, and Louis Salvatore Cosentino, Belle Mead, both of N.J., assignors to RCA Corporation

Filed Apr. 23, 1970, Ser. No. 31,162
Int. Cl. G02b 27/00
U.S. Cl. 350—3.5 6 Claims

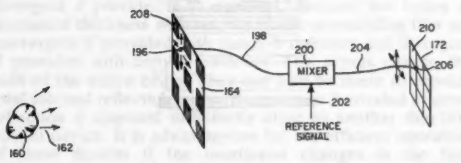


A holographic optical memory is disclosed which utilizes an erasable storage medium such as manganese bismuth. Light from a laser is directed to an illumination hologram, from which a diffracted beam illuminates an object. Light from the object is condensed on a small area of the storage medium. The undiffracted light passing through the illumination hologram is directed as a reference beam to the storage medium, where it interacts with the object beam to record a hologram of the object on the storage medium.

3,614,190
UNDISTORTED IMAGE DEMAGNIFICATION BY HOLOGRAPHIC INFORMATION SAMPLING

Kenneth A. Haines, Hockessin, Del., assignor to Holotron Corporation, Wilmington, Del.

Filed Mar. 28, 1969, Ser. No. 811,438
Int. Cl. G02b 27/22
U.S. Cl. 350—3.5 7 Claims



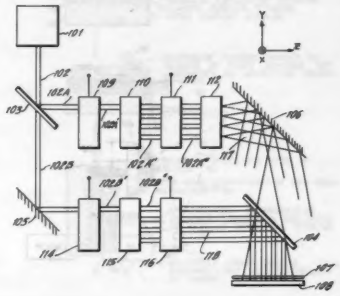
A technique of periodically sampling holographic information to construct a reduced size hologram with the sampled information being joined side-by-side from which a demagnified image of the original object is reconstructed.

3,614,191
ASSOCIATIVE MEMORY EMPLOYING HOLOGRAPHY

Mituhito Sakaguchi, and Nobuo Nishida, both of Tokyo, Japan, assignors to Nippon Electric Company, Limited, Tokyo, Japan

Filed Apr. 1, 1969, Ser. No. 812,069
Claims priority, application Japan, Mar. 29, 1968, Mar. 29, 1968, Mar. 29, 1968, 20907;20908;20909
Int. Cl. G02b 27/22
U.S. Cl. 350—3.5 11 Claims

An associative memory employing holographic techniques. During read-in first and second space modulated beams are each split into true and complementary groups of binary modulated beams. The resulting beam groups are caused to interact with one another to form a hologram. Upon readout, one or more digit positions are caused to scan many of the patterns of the hologram. Those patterns in the hologram

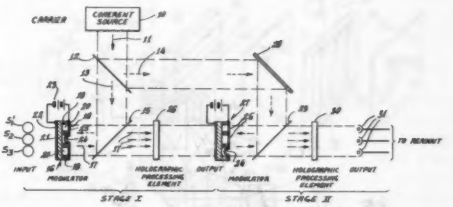


having digit positions which coincide with the interrogating digit positions are readout of memory in their entirety (i.e. both the coincident digit positions and the remaining digit positions of a pattern are readout of memory).

3,614,192
HOLOGRAPHIC LOGIC OPERATOR FOR AN OPTICAL DATA PROCESSING SYSTEM

Kendall Preston, Jr., New Haven, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Division of Ser. No. 736,505, June 12, 1968, Pat. No. 3,553,460.
Filed Dec. 18, 1969, Ser. No. 888,110
Int. Cl. G02b 27/00
U.S. Cl. 350—3.5 3 Claims



A method of processing information by combining regions of a radiant energy beam which have been modulated according to the information. The combination is performed according to a pattern of phase relationships which produces the desired function of the information. A preferred apparatus for performing this method includes a source of coherent radiation, means for phase modulating regions of the beam and a holographic processing element which corresponds to an array of points having the selected pattern of phase relationships. The output may be determined by a second modulating means associated with a subsequent processing stage or by a readout means.

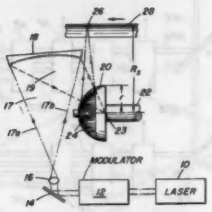
3,614,193
LIGHT SCANNING SYSTEM UTILIZING DIFFRACTION OPTICS

Leo Beiser, Flushing Manor, N.Y., assignor to Columbia Broadcasting Systems, Inc.

Filed Apr. 15, 1970, Ser. No. 28,638
Int. Cl. G02b 17/00
U.S. Cl. 350—7 9 Claims

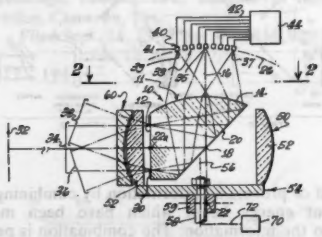
For use in apparatus for transmitting and/or recording intelligence, optical scanning means including a spinner element in the form of a partial sphere having a plurality of diffracting zone-type lenses distributed therearound and adapted for continuous rotation about a concentric axis, and

an optical system for directing onto said spherical surface light flux converging to a first focal point on the rotational axis of the spinner so that each impinging ray arrives substantially normal to the spherical surface. The individual zone-type lenses reconverge rays impinging thereon to new



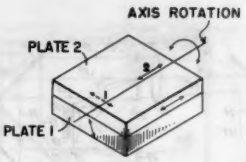
foci which scan an image surface lying along a circular locus as the spinner is rotated. The optical system which converges the incoming light onto the spinner element is preferably nonaxial with respect to the rotating system, and may comprise either a diffraction reflector or a geometrical reflector.

3,614,194
WIDE FIELD OPTICAL SCANNER
Clyde W. Harris, Santa Barbara, Calif., assignor to The Te Company, Santa Barbara, Calif.
Filed June 27, 1969, Ser. No. 837,120
Int. Cl. G02b *17/00*
U.S. Cl. 350—7 **5 Claims**



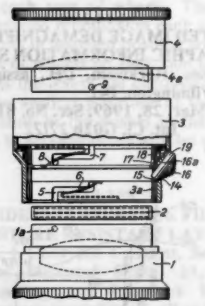
Raster scanning of a scene is produced by coaxial rotation of a ring of planoconvex refractive elements mounted with their convex faces in a common spherical surface. A complementary plano-concave window element is fixedly mounted just outward of the ring on the radial optical axis, compensating the convex curvature of the ring elements. The window and the adjacent ring element form a prism of variable angle, deflecting the optical axis in scansion in the plane of the ring. The scene is imaged by a thick optical lens fixedly mounted on the optical axis within the rotating ring, with plane entrance face closely adjacent the ring elements and with spherically convex exit face centered optically at the entrance face, which then acts as entrance pupil. The lens element has an integral totally reflective face which obliquely intersects the optical axis between entrance and exit faces, directing the axis along the axis of ring rotation. The spherical image surface can then accommodate an extended line of radiation sensors, providing an extended field in the plane perpendicular to the scanning plane.

3,614,195
RETARDATION COMPENSATOR PLATE FOR A POLARIZING MICROSCOPE
David W. Vollmer, Brighton, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.
Filed Nov. 10, 1969, Ser. No. 875,465
Int. Cl. G02b *29/28*
U.S. Cl. 350—13 **11 Claims**



A retardation plate for use in an Ehringhaus-type compensator for measuring retardation of light in a polarizing microscope, said plate being composed of two elements of plane parallel polished crystal quartz, the relative thickness of which have numerical ratio other than 1.0 and preferably have a numerical ratio of substantially 0.6.

3,614,196
COMBINED LENS HOOD AND FILTER SUPPORT
Werner Schlapp, Asslar, Germany, assignor to Ernest Leitz GmbH, Wetzlar, Germany
Filed Aug. 31, 1970, Ser. No. 68,374
Claims priority, application Germany, Sept. 12, 1969, May 29, 1970, P 19 46 284.1;P 20 26 345.0
Int. Cl. G03b *11/04*
U.S. Cl. 350—58 **6 Claims**

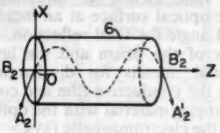


A lens hood adapted to be mounted on the front portion of an objective, to support a filter in front of the objective, to be reversibly mountable on the objective for transporting and having a friction wheel for holding and rotating the filter.

3,614,197
SOLID OPTICAL WAVE GUIDE HAVING A RADIALLY VARYING REFRACTIVE INDEX
Jun-ichi Nishizawa; Shojiro Kawakami, and Kiyasu Zen'iti, all of Sendai-shi, Japan, assignors to Semiconductor Research Foundation, Kawauchi, Sendai-shi, Japan
Filed Apr. 23, 1968, Ser. No. 723,402
Claims priority, application Japan, Apr. 27, 1967, 27,054
Int. Cl. G02b *5/14*
U.S. Cl. 350—96 WG **4 Claims**

An apparatus for transmitting high-speed modulated light includes a solid optical waveguide comprising a medium having a refractive index which progressively decreases in the radial direction within the cross-sectional area of the optical

waveguide so as to minimize variations in the average transmission velocity of the light beam in the axial direction



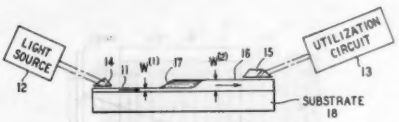
of the guide which are caused by different routes of travel of the light beam.

3,614,198

THIN-FILM OPTICAL DEVICES

Raymond J. Martin, Middlesex Borough, and Reinhard Ulrich, Matawan, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed June 23, 1969, Ser. No. 835,484
Int. Cl. G02b *5/14*
U.S. Cl. 350—96 **17 Claims**



Thin-film optical devices are disclosed which function within the plane of a thin-film as lenses or prisms. They function in two dimensions, since the thin dimension of the film serves to guide the beam with respect to the third dimension. The devices are formed integrally from the body of the thin-film by variations in its thickness either along the path of the light beam or by such variations both along the path of the beam and transversely thereto, with contours of constant thickness intersecting the light path in an orientation affecting change of the direction of propagation of at least a portion of the light. Lenses of increased thickness are convergent if provided with convex contours or divergent if provided with concave contours; but lenses of decreased thickness with respect to the surrounding film are convergent if provided with concave contours and divergent if provided with convex contours. The prisms change the path of the entire beam. They can also be made to provide total internal reflection within the prism or frustrated internal reflection if disposed sufficiently close to another thin-film optical device. It is advantageous for the efficient operation of these devices if the mentioned changes in the film thickness are not abrupt but rather are tapered smoothly over a distance of several wavelengths of the light. This minimizes reflection losses and conversion to other modes.

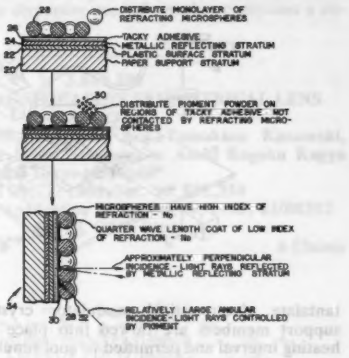
3,614,199

REFLEX REFLECTING PRODUCTS, PROCESSES AND DEVICES USEFUL WITH SUCH PRODUCTS

Gerald Altman, 41 Westminster Road, Newton Centre, Mass.

Filed July 3, 1968, Ser. No. 742,423
Int. Cl. G02b *5/12*
U.S. Cl. 350—105 **4 Claims**

Special purpose reflex reflecting sheets are characterized by closely packed refracting microspheres and interspersed pigment particles, both of which are held in fixed optical relation to a metallic reflecting stratum by a thin adhesive stratum. In one form, the product is designed to return light without substantial diffusion when its angle of incidence is approximately normal and to return light with substantial diffusion when its angle of incidence is substantially oblique. This product is particularly useful for the combined purposes of direct viewing in terms of diffuse light controlled by the pigment and of episcopic projection onto a viewing screen in


28
DISTRIBUTE MONOLAYER OF REFRACTING MICROSPHERES
26
24
22
20
TACKY ADHESIVE
METALLIC REFLECTING STRATUM
PLASTIC SURFACE STRATUM
PAPER SUPPORT STRATUM
30
DISTRIBUTE PIGMENT POWDER ON REGIONS OF TACKY ADHESIVE NOT CONTACTED BY REFRACTING MICROSPHERES
MICROSPHERES HAVE HIGH INDEX OF REFRACTION - No
QUARTER WAVE LENGTH COAT OF LOW INDEX OF REFRACTION - Nb
APPROXIMATELY PERPENDICULAR INCIDENCE - LIGHT RAYS REFLECTED BY METALLIC REFLECTING STRATUM
34
RELATIVELY LARGE ANGULAR INCIDENCE - LIGHT RAYS CONTROLLED BY PIGMENT
30
28
32

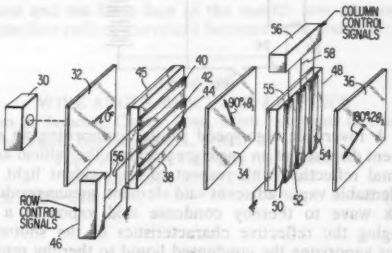
terms of directed light controlled by the metallic reflecting stratum.

3,614,200

LIGHT VALVE MATRIX

George William Taylor, Princeton, N.J., assignor to RCA Corporation

Filed Nov. 12, 1969, Ser. No. 875,822
Int. Cl. G02f *1/26*
U.S. Cl. 350—150 **8 Claims**



A light valve matrix having rows on a first optically active element and columns on a second optically active element in the path of a beam of polarized light. In response to a control signal applied to a row or column, the portion of the element beneath the row or column rotates or retards the plane of polarization of the light through an angle θ_2 and the remainder of the element rotates or retards the plane of polarization of the light through a different angle θ_1, which may be zero. A polarization angle discriminator means such as a polarizer located between the two elements blocks the light at angle θ_1 and passes all or most of the light at θ_2 and a second polarizer placed after the second element blocks the light rotated through an additional angle θ_1 and passes all or most of the remaining light.

3,614,201

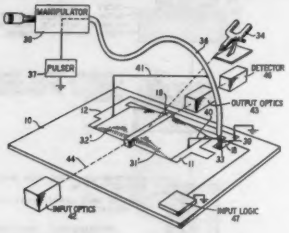
ACOUSTICALLY ABSORBENT MOUNTING METHOD AND APPARATUS FOR OPTICAL MODULATOR

Martin R. Biazzo, Holmdel; Bernard G. King, Rumson, N.J., and William C. G. Ortel, New York, N.Y., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Dec. 2, 1968, Ser. No. 780,347
Int. Cl. G02f *1/28*
U.S. Cl. 350—160 **15 Claims**

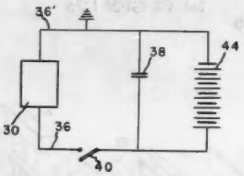
Acoustical ringing which results from piezoelectric effects in an electrooptical modulator is suppressed by mounting the modulator crystal between massive, acoustically absorbent,

support members which also provide an electric circuit interface for applying electric signals to the modulator. Solder provides such an absorbent mounting for a lithium



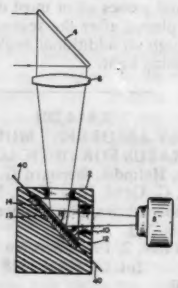
tantalate electrooptical modulator crystal. Both solder support members are flowed into place during the same heating interval and permitted to cool simultaneously.

3,614,202
ELECTRICALLY ACTUATED SHUTTER
Eugene C. Letter, Penfield, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.
Filed Jan. 3, 1964, Ser. No. 335,695
Int. Cl. G02f *1/34*
U.S. Cl. 350—160 **5 Claims**



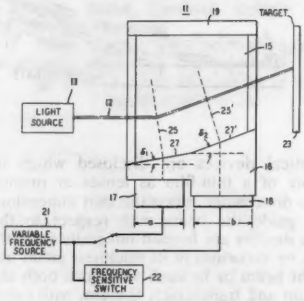
1. A reversible high-speed shutter comprising an optical element disposed at an angle greater than the critical angle of internal reflection with respect to an incident light ray, a condensable vapor adjacent said element, means producing a shock wave to thereby condense said vapor to a liquid changing the reflective characteristics of the shutter, and means vaporizing the condensed liquid to thereby return the shutter to its original condition.

3,614,203
HIGH-SPEED OPTICAL SHUTTER
Eugene C. Letter, Penfield, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.
Filed June 18, 1965, Ser. No. 465,837
Int. Cl. G02f *1/34*
U.S. Cl. 350—160 **11 Claims**



1. A high-speed optical shutter comprising a prism of high refractive index having an internally reflecting optical surface; a layer of reflection-changing material spaced from the optical surface of the prism, said layer including a fluid carrier having high refractive index and having radiation absorption means; an electrically conducting film contacting the layer, and means for applying an electrical potential to the conducting film; means for directing electromagnetic rays toward the optical surface at an incident angle greater than the critical angle for total reflection, as defined by the refractive index of the prism and the layer of reflection-changing material; means for discharging the electrical potential across the conductive film and contacting the layer of reflection-changing material with the optical surface of the prism to absorb the electromagnetic rays.

3,614,204
ACOUSTIC LIGHT DEFLECTION CELLS
Douglas A. Pinnow, Berkeley Heights, and Samuel R. Williamson, Irvington, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.
Filed Mar. 7, 1969, Ser. No. 805,189
Int. Cl. G02f *1/28*
U.S. Cl. 350—161 **6 Claims**

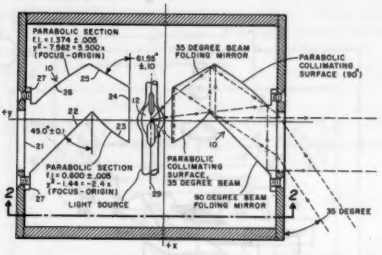


The efficiency and bandwidth of an acoustic deflection cell are increased by using two transducers tuned to adjacent frequency bands and buffer member for causing the acoustic waves from the two transducers to propagate in different directions that are separately optimized. A frequency-sensitive switch connects an AC source to only one of the two transducers. The buffer member is designed to minimize or eliminate light deflection by spurious reflected acoustic components.

3,614,205
TWO-CHANNEL OPTICAL TRANSMITTER
Wesley H. Whitman, Jr., La Sierra, and Richard D. Anderson, Riverside, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy
Filed Mar. 26, 1965, Ser. No. 443,110
Int. Cl. G02b *27/14*
U.S. Cl. 350—171 **3 Claims**

An optical prism system for obtaining two separate light

beams by collimating light from a single source, and projecting it through a beam forming and folding light guide

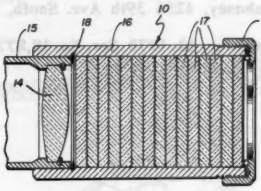


prism which forms the light into two separate fields of view.

3,614,206
APPARATUS FOR PHOTOGRAPHY

Thomas A. Kenney, Hull, Mass., assignor to Kenzdof Incorporated, Hull, Mass.

Filed Mar. 23, 1970, Ser. No. 21,951
Int. Cl. G02b *1/06*
U.S. Cl. 350—179 **5 Claims**

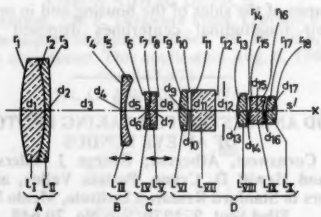


Apparatus for photography including solid plates of optically clear material arranged closely together with a very thin layer of liquid between.

3,614,207
PHOTOGRAPHIC OBJECTIVE WITH CONTINUOUSLY VARIABLE FOCAL LENGTH

Heinrich Basista, Oberkochen, Germany, assignor to Carl Zeiss-Stiftung, Heidenheim (Brenz), Wuerttemberg, Germany

Filed May 18, 1970, Ser. No. 37,993
Claims priority, application Germany, May 29, 1969, P 19 27 278.7
Int. Cl. G02b *15/14*
U.S. Cl. 350—184 **2 Claims**

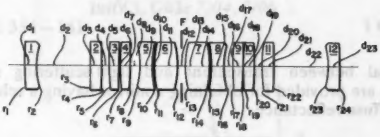


A photographic objective of variable focal length consisting of four axially aligned optical members, a first collective member, a second dispersive member, a third dispersive member and a fourth collective member, with an iris diaphragm between the third and fourth member and in which for the purpose of varying the focal length the second and third members are axially adjustable relatively to each other and to the collective member. The second axially adjustable member comprises a single dispersive lens standing along by itself. A predominantly chromatically effective cemented face is provided in the dispersive third member while the dispersive second member comprises a single lens.

3,614,208
UNITARY MAGNIFICATION SYMMETRICAL LENS SYSTEM

Tohru Matsumoto, Tokyo-to, and Tomokazu Kazamaki, Tokyo, both of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo-to, Japan

Filed Dec. 2, 1969, Ser. No. 881,354
Claims priority, application Japan, Dec. 4, 1968, 43/88352
Int. Cl. G02b *9/64*
U.S. Cl. 350—214 **4 Claims**

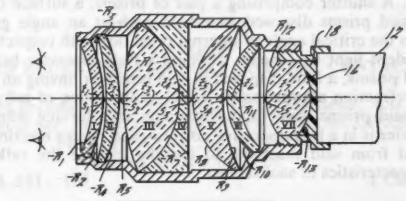


A unity magnification lens system of focal length F comprises a symmetrical pair of similar telephoto lens systems and includes 12 lenses, the sixth and seventh lenses being singlets or doublets and the remaining lenses being singlets, the first, fifth, eighth and twelfth lenses being negative and the rest positive. The absolute value of each lens face radius of curvature exceeds 0.7F and of each positive lens exposed face exceeds F, the index of refraction of each positive lens exceeds 1.65, and the rear face of the first lens and the front face of the twelfth lens are concave with absolute radii of curvature between 0.7F and 1.5F.

3,614,209
WIDE ANGLE-BIOCULAR EYEPIECE

William J. Seaman, Center Line, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Feb. 24, 1970, Ser. No. 13,408
Int. Cl. G02b *5/16, 9/62, 25/04*
U.S. Cl. 350—215 **7 Claims**



A wide-angle biocular eyepiece comprising six spaced optical elements.

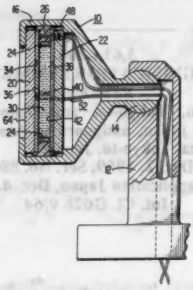
3,614,210
LIQUID CRYSTAL DAY/NIGHT MIRROR

Sandor Caplan, Trenton, N.J., assignor to RCA Corporation

Filed Nov. 6, 1969, Ser. No. 874,524
Int. Cl. G02b *5/08, 1/28*
U.S. Cl. 350—278 **6 Claims**

The mirror comprises front and rear substrates sandwiching a liquid crystal material therebetween. The front substrate is transparent and has, on its inner surface, a transparent electrode. The rear substrate has, on its inner surface, a metallic electrode having a specular surface. In use, the mirror is mounted relative to a viewer such that images reflected from both the outer surface of the front

substrate and the specular surface will reach the viewer. Terminal means are provided for applying a voltage between the electrodes for selectively switching the liquid crystal material between transparent and light-scattering states. Means are provided for obtaining a mirror having a relatively low diffuse reflectance.

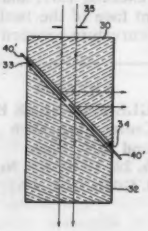


3,614,211

ELECTRICALLY ACTUATED SHUTTER

Eugene C. Letter, Penfield, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Jan. 3, 1964, Ser. No. 335,694
Int. Cl. G02f *1/34*
U.S. Cl. 350—285 1 Claim



1. A shutter comprising a pair of prisms, a surface of one of said prisms disposed in a light path at an angle greater than the critical angle of internal reflection with respect to an incident light ray, means defining a fluid reservoir between said prisms, a fluid disposed in said reservoir having an index of refraction approximately equal to the index of refraction of said prisms, said fluid contacting said surface when the shutter is in a first operative position, and means ejecting said fluid from said reservoir to thereby change the reflective characteristics of said shutter.

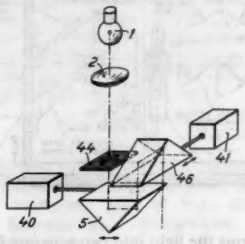
3,614,212

OSCILLATING LIGHT BEAM GENERATING DEVICE

Fromund Hock, Wetzlar, Germany, assignor to Ernst Leitz GmbH, Wetzlar, Germany

Filed July 18, 1969, Ser. No. 842,849
Claims priority, application Germany, Aug. 1, 1968, P 17 73 965.0
Int. Cl. G02f *1/34*; G01b *11/04*
U.S. Cl. 350—285 5 Claims

In a photoelectric position-determining apparatus a device for generating an oscillating light beam is disclosed. The device comprises a light source, a diaphragm, oscillating optical elements, and a driving mechanism therefor. The diaphragm is mounted in a stationary position and the optical elements, which may be prisms or double mirrors, are arranged behind the diaphragm in the direction of the light flux. The first optical element oscillates in a plane which is parallel to the plane of the diaphragm and almost perpendicular to the direction of the impinging light. As a consequence of this arrangement the light beam oscillates with an amplitude double the width of the oscillation amplitude of the mechanical driving mechanism.



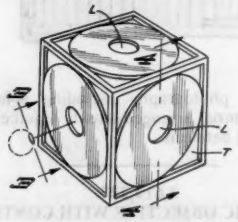
A second optical element is disposed in a lateral offset manner with respect to the first optical element and oscillates in the parallel plane so that the directions of oscillation of the first and second optical elements are positioned at an angle with respect to each other.

3,614,213

ARTISTIC REFLECTOR VIEWER

Timothy K. Mahoney, 4256 39th Ave. South, Minneapolis, Minn.

Filed Mar. 12, 1970, Ser. No. 18,877
Int. Cl. G02b *17/00*
U.S. Cl. 350—299 4 Claims



An artistic-viewing device which, through the effects of internal opposed and angularly related mirrors, produces a variety of symmetrical optical illusions. The structure includes a three-dimensional housing having at least two pairs of opposing generally transparent walls, the interiors of said walls at portions thereof being covered by at least two sets of opposing spaced mirrors. The mirrors preferably are of elongate construction diagonally disposed with reference to the shapes of the sides of the housing and in opposing sets have their longitudinal centerlines disposed in crossed relation.

3,614,214

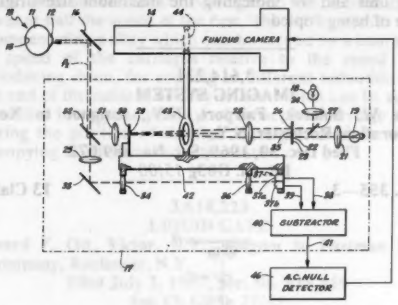
METHOD AND SYSTEM FOR TAKING PHOTOGRAPHS OF AN EYE FUNDUS

Tom N. Cornsweet, Atherton; George J. Eilers, Redwood City, and Hewitt D. Crane, Portola Valley, all of Calif., assignors to Stanford Research Institute, Menlo Park, Calif.

Filed Sept. 9, 1970, Ser. No. 70,648
Int. Cl. A61b *3/10, 3/14*; G01b *9/00*
U.S. Cl. 351—7 9 Claims

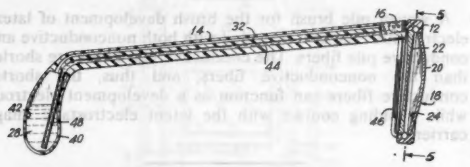
An optical system and method for photographing an eye fundus in which a fundus camera having a focus control is aligned with the position of an eyelens. An automatic optometer is coupled to the fundus camera and is adapted to sense refractive power of the eye. Means are coupled to the automatic optometer and the fundus camera for controlling

the focus of the fundus camera and activating the fundus camera to take a photograph when the focus of the fundus



camera matches the instantaneous refractive power of the eye.

3,614,215
FLUID BIFOCAL SPECTACLE
Leo Mackta, 444 Beach 132nd St., Belle Harbor, N.Y.
Filed Apr. 23, 1970, Ser. No. 31,234
Int. Cl. G02c 7/06; G02b 3/14
U.S. Cl. 351—41 **2 Claims**

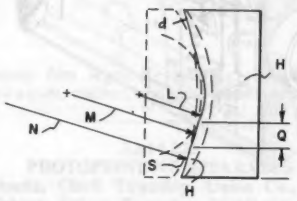


A bifocal spectacle having a composite split lens with a fluid compartment therein for receiving a refractive fluid, whereby the lens will have a first focal length when the fluid compartment is filled with the fluid and a second focal length when the compartment is empty. Fluid reservoir means are provided in communication with the fluid compartment in such a manner that the fluid will automatically flow from the reservoir to the compartment under the influence of gravity when the spectacle is tilted downwardly and forwardly, as for close reading, and will return to the reservoir when the spectacle is returned to its normal, substantially horizontal position. Gravity-operated piston means may be provided for enhancing the flow of fluid responsive to a slight tilting of the spectacle.

3,614,216
VISION-AIDING DEVICE
Sol Roy Rosenthal, 230 E. Delaware Place, Chicago, Ill.
Continuation-in-part of application Ser. No. 797,958, Feb. 10, 1969, now abandoned. This application Aug. 6, 1969, Ser. No. 847,871
Int. Cl. G02c 7/10, 7/16
U.S. Cl. 351—44 **10 Claims**

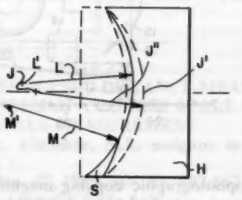
Sunglasses or eyeglasses made of an elongated sheetlike member of a flexible transparent material having a memory sufficient to bias it to coil itself into a roll shape whenever untensioned. End portions are shaped to fit in the orbito-temporal fossae of the human head at a location just behind the zygomatic process. For a sunshade, the device may be inverted. For eyeglasses, the member is provided with opaque regions located in the path of vision of the wearer, and a plurality of apertures between about 0.025–0.036 inch in diameter are provided in these opaque regions in rows spaced-apart between 0.1 inch and 0.17 inch. Variations in the shape and form of the end portions as well as additional nose bridge anchors are utilized to provide stability and comfort for the wearer.

3,614,217
FUSED CONCENTRIC TRIFOCAL CORNEAL CONTACT LENS
Leonard Bronstein, 7457 East Vista Drive, Scottsdale, Ariz.
Division of Ser. No. 582,044, Sept. 26, 1966, Pat. No.3,472,587.
Filed July 9, 1969, Ser. No. 840,424
Int. Cl. G02c 7/04, 7/06
U.S. Cl. 351—161 **1 Claim**



Multifocal corneal contact lenses which may be fitted in relationship similar to single vision contact lenses, having anterior curve or curves based upon the necessary distance power desired; posterior curve or curves, as desired, to maintain proper relationships with the cornea; and interface curves, between the two fused-together materials of different refractive index necessary to provide the proper power effects for the various seeing positions; the far vision portion of said lenses being concentrically located in the central portion of the lens and the near vision portions being located in surrounding relation with the far vision portions and near the periphery of the lens, and the lens thus being annularly symmetrical to permit rotation of the lens on the cornea of the eye into various positions without changing the optical functions of the lens with relation to the eye.

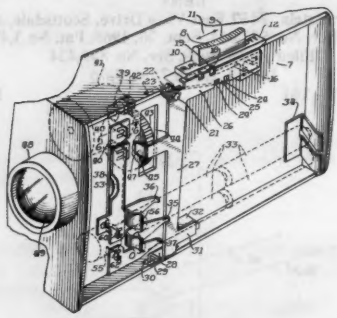
3,614,218
FUSED ECCENTRIC TRIFOCAL CORNEAL CONTACT LENS
Leonard Bronstein, 7457 East Vista Drive, Scottsdale, Ariz.
Division of Ser. No. 582,044, Sept. 26, 1966, Pat. No.3,472,587.
Filed July 9, 1969, Ser. No. 840,525
Int. Cl. G02c 7/04, 7/06
U.S. Cl. 351—161 **1 Claim**



Multifocal corneal contact lenses which may be fitted in relationships similar to single vision contact lenses, having

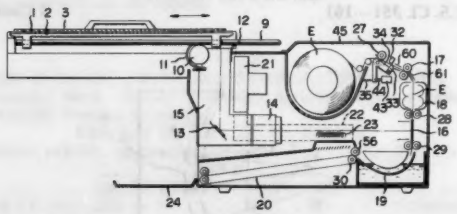
anterior curve or curves based upon the necessary distance power desired; posterior curve or curves, as desired, to maintain proper relationships with cornea; and interface curves, between the two fused together materials of different refractive index necessary to provide the proper power effects for the various seeing positions.

3,614,219
CONTROL LEVER SWITCHING MECHANISM
Richard K. Carlson, Chicago, Ill., assignor to Bell & Howell Company, Chicago, Ill.
Filed Sept. 2, 1969, Ser. No. 854,484
Int. Cl. G03b *1/00*
U.S. Cl. 352—178 **6 Claims**



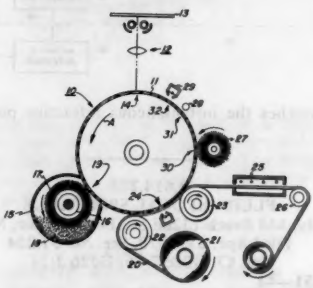
The invention contemplated concerns itself with switch structure which can be manually controlled or which may be locked to operate continuously freeing the hands of the photographer. A feature of the invention is a control lever which is fulcrummed and selectively operates with multiple electrical contacts which govern the operation of a prime mover in a motion-picture camera, and which controls a claw motivating the film in exposure through an apertured gear. A notched portion in the gear is engaged by a stop lug on the control lever to arrest the apertured gear in a position to block out all light from the film in the cartridge, when the camera is not in use.

3,614,220
ELECTROPHOTOGRAPHIC COPYING DEVICE
Shigehiro Komori, Yokohama-shi; Jiro Sato, Tokyo, and Akira Kurahashi, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha Co., Ltd.
Filed Dec. 3, 1968, Ser. No. 780,653
Claims priority, application Japan, Dec. 11, 1967, Dec. 15, 1967, 79376/1967;105383/1967
Int. Cl. G03g *15/00*
U.S. Cl. 355—3 **3 Claims**



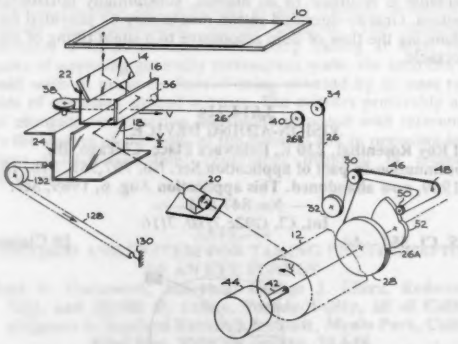
An electrophotographic copying machine using a roll of sensitive paper in which the original holder for carrying the original reciprocates on the machine case of the electrophotographic copying device. While the original holder is in its backward motion, the original is illuminated so as to subject the electrophotographic-sensitive paper to a slit exposure, and the copy is obtained through subsequent steps of developing and fixing. The reciprocating motion of the original is related to the paper feed so that the paper is cut to the length of the original. An indicator is provided for indicating the size of the roll of sensitive paper in the paper-feeding unit and for indicating the maximum size original capable of being copied.

3,614,221
IMAGING SYSTEM
Thomas W. Solarek, Fairport, N.Y., assignor to Xerox Corporation, Rochester, N.Y.
Filed Dec. 30, 1969, Ser. No. 889,072
Int. Cl. G03g *15/00*
U.S. Cl. 355—3 **13 Claims**



A woven pile brush for the brush development of latent electrostatic images is provided with both nonconductive and conductive pile fibers. The conductive pile fibers are shorter than the nonconductive fibers, and thus, the shorter conductive fibers can function as a development electrode while avoiding contact with the latent electrostatic image carrier.

3,614,222
OPTICAL DRIVE SYSTEM FOR REPRODUCING MACHINE
Gerald Post, Kew Gardens; Charles M. Buchholtz, New York, N.Y., and Luciano Rattin, Ivrea, Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy
Filed Apr. 24, 1970, Ser. No. 31,713
Int. Cl. G03g *15/00*
U.S. Cl. 355—8 **13 Claims**



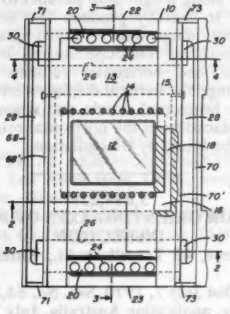
A copying machine which enables the choice of different magnification or reduction ratios comprising a glass plate on which the document to be copied is placed, a reproducing drum which converts light images focused thereon, into visible images on copy paper, and an optical system which scans a document on the glass plate and focuses the scanning image on the reproducing drum. The optical system includes two mirror-holding carriages that sweep across the glass

plate, for reflecting light from a document on the glass plate through a stationary lens onto the reproducing drum. The carriages are moved by a cable wound by a drum, the cable being fixed to a first of the carriages and extending around a pulley on a second of the carriages so the second carriage moves at half the speed of the first. The cable extends around a compensating pulley which can be moved by a cam to alter the speed of the carriages relative to the speed of the reproducing drum, for copying at different reduction ratios. One end of the cable is held by an arm which can be adjusted in position to vary the position of the second carriage without altering the position of the first carriage, which is required for copying at different reduction ratios.

3,614,223
LIQUID GATE

Howard F. Ott, Victor, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed July 3, 1969, Ser. No. 838,849
Int. Cl. G03b *27/52*
U.S. Cl. 355—30 **12 Claims**



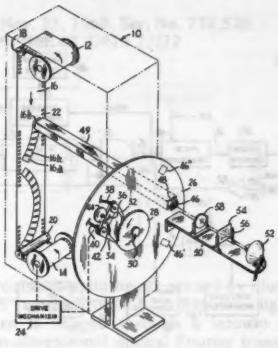
A film gate adapted for use in a film projection printer, wherein liquid is directed against both surfaces of a film as the film is guided through the gate. The liquid flows from jet orifices positioned near the optical windows of the gate, away from the windows, to vacuum orifices positioned adjacent the entrance and exit ends of the gate. The vacuum orifices remove the liquid from the film. The movement of the fluid from the jet orifices to the vacuum orifices "sweeps" and coats both film surfaces with a liquid layer as the film moves through the gate.

3,614,224
METHODS AND APPARATUS FOR PRODUCING FILM DISC SEGMENTS

Warren C. Portman, Mahopac, N.Y., assignor to Columbia Broadcasting System, Inc., New York, N.Y.

Filed May 14, 1969, Ser. No. 824,452
Int. Cl. G03b *27/46*
U.S. Cl. 355—53 **4 Claims**

A camera for copying a series of transparencies onto 35-millimeter film in 90° circular arcs as a step in constructing audio-visual cartridges. These cartridges are circular discs having 52 spaced transparencies each arranged on a total of four such strips per cartridge. The projector, transparency, and optics of the apparatus move arcuately with respect to

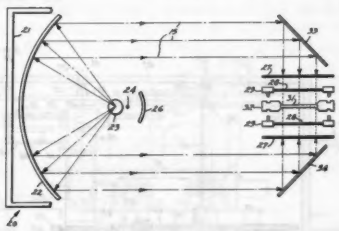


the stationary film segment receiving the images, driven stepwise by a cam, ratchet, and pawl mechanism.

3,614,225
PHOTOPRINTING APPARATUS

Donald Dinella, Clark Township, Union Co., and Eckert Franz Schutz, Edison Township, Middlesex Co., both of N.J., assignors to Western Electric Company, Incorporated, New York, N.Y.

Filed Nov. 6, 1969, Ser. No. 874,446
Int. Cl. G03b *27/04*
U.S. Cl. 355—85 **7 Claims**



A temperature-controlled parabolic reflector, for reflecting an essentially parallel light beam, is employed to direct light from a light source to an image master spaced a predetermined distance from a printed circuit board to expose certain portions of a photoresist to define a circuit pattern. Electrical circuits are subsequently formed by electroless copper plating to the areas exposed by the pattern.

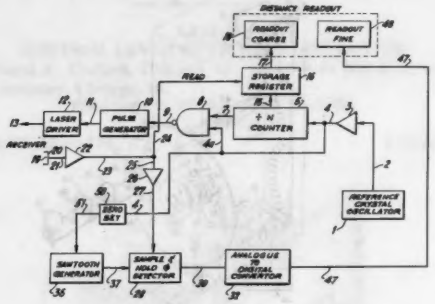
3,614,226
PHASE-LOCKED PULSED DISTANCE-MEASURING EQUIPMENT UTILIZING A COARSE SCALE AND FINE SCALE MEASUREMENT

Ronald A. Vergoz, Allendale, N.J., assignor to Holobeam, Inc., Paramus, N.J.

Filed Mar. 17, 1969, Ser. No. 807,667
Int. Cl. G01c *3/08*
U.S. Cl. 356—5 **5 Claims**

An electromagnetic distance-measuring device wherein the time of transit of signals to and from a target is measured to determine a coarse scale distance to the target. An additional fine scale measurement of the distance to the target is

provided by measuring the phase shift of the returned signal. The reflected energy, when received, triggers a counter to provide the coarse time measurement. The fine scale



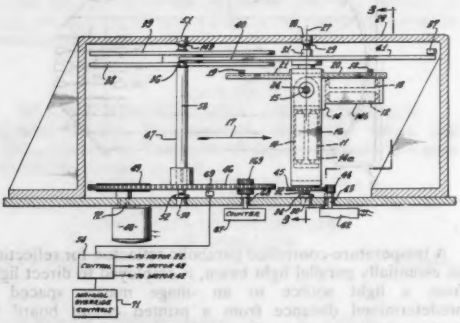
increment is provided by measuring the phase shift of the returned signal relative to a high-frequency control signal.

3,614,227

GRATING DRIVE MECHANISM

Kenyon P. George, Arcadia, and Edouard Horace Siegler, Jr., Claremont, both of Calif., assignors to Cary Instruments, Monrovia, Calif.

Filed July 25, 1969, Ser. No. 844,835
Int. Cl. G01j *3/06, 3/18, 3/42*
U.S. Cl. 356—95 **14 Claims**



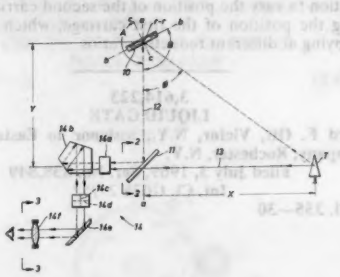
The invention concerns an optical grating drive apparatus wherein a carriage for multiple diffraction gratings is movable between a plurality of locations, there being stops to limit carriage movement at such locations in which different gratings are selectively presented in the path of an incident beam; also a plurality of cam followers are shiftable relative to rotary cam means between positions in which different followers selectively engage the cam means and are displaced in response to cam means rotation; the followers and carriage have operative interconnection such that when a selected follower is engaged with the cam means the carriage may occupy alternate locations in order to selectively present corresponding gratings to the beam path; and displacement of a selected follower in response to cam rotation effects rotation of a selected grating in the beam path.

3,614,228

OPTICAL RANGE FINDER HAVING NONOVERLAPPING COMPLETE IMAGES

William E. Lyon, Seabrook, Tex., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Sept. 30, 1968, Ser. No. 763,743
Int. Cl. G01c *3/12*
U.S. Cl. 356—17 **1 Claim**



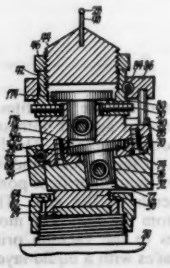
A 90–100 percent reflective first surface mirror is disposed to direct a reflected image to a 70 percent reflective, 30 percent transmitting beam splitter which reflects the reflected image along a light path parallel to the light path of the true image to thereby produce two separate full view images. The true image and reflected image are directed through a magnifying telescope having infinite projected crossed vertical and horizontal reticles. The mirror is rotatable to change the vertical displacement of the reflected image from the horizontal reticle and when the two images are equally displaced from the horizontal reticle, the range of the image may be found by triangulation.

3,614,229

DEVICE FOR ORIENTING AXES OF BODIES FOR INSPECTION

William A. Denne, 43 Trevellyan St., Elsternwick, Victoria, Australia

Filed July 7, 1970, Ser. No. 52,834
Claims priority, application Australia, July 7, 1969, 57,569
Int. Cl. G01n *21/04*
U.S. Cl. 356—31 **19 Claims**

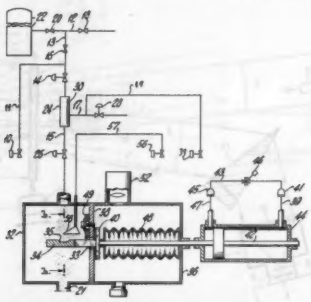


A goniometer head for orienting a crystal so that a plane associated therewith is normal to a predetermined directional axis comprising a support rotatable about an axis transverse to the directional axis so that the latter lies in the surface of an imaginary cone generated about the transverse axis, and a mounting for the crystal carried by the support and rotatable relative thereto about an adjustment axis which passes through the apex of the cone to cause a crystal axis normal to the plane to lie in the surface of the cone so that if the normal axis is not in the directional axis when it has been adjusted to lie in the surface of the cone the support member can be rotated about the transverse axis to move the normal axis around the cone until it lies in said directional axis.

3,614,230
APPARATUS AND METHOD FOR SAMPLING AND ANALYZING FLUID SOLIDS

Harry M. Crawford, Port Murray, N.J., assignor to Esso Research and Engineering Company

Filed May 8, 1969, Ser. No. 822,967
Int. Cl. G01n *1/00, 21/00, 21/48*
U.S. Cl. 356—36 6 Claims

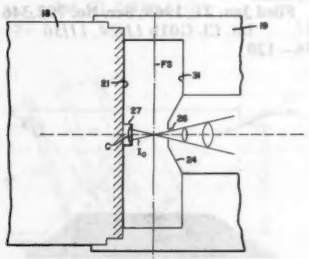


Method and apparatus for collecting and analyzing fluidized solids samples, e.g., determining carbon content on fluid catalytic cracking catalyst, comprising means for collection and defluidizing sample, means for analyzing sample by light reflectance and means for sealing moving parts and analysis chamber from solids contamination.

3,614,231
OPTICAL AEROSOL COUNTER

Clyde C. Shaw, Los Altos Hills, Calif., assignor to Coulter Electronics, Inc., Hialeah, Fla.

Filed Feb. 12, 1968, Ser. No. 704,924
Int. Cl. G01n *1/00, 21/00, 15/02*
U.S. Cl. 356—37 6 Claims

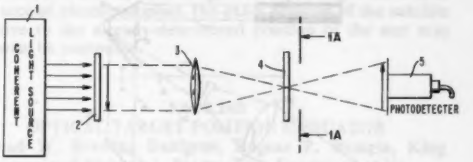


An optical liquid or aerosol particle sensor of the kind in which a focused light beam is projected through a flow stream of suspended particles to determine the particle size and number concentration by measuring the scattered components of the focused light beam. A specularly reflecting or absorbing mask is located closely adjacent that portion of the flow stream intercepted by the focused light beam. This mask absorbs and specularly reflects the focused light beam and thus blocks off the illuminating light from the scattered light detection element. This mask possesses a reflecting surface which causes essentially all of the unabsorbed portion of the illuminated light to retrace its incoming path so that this part of the light beam is never received at the light measuring part of the aerosol sensor. The sensor may also include a housing having a highly reflective inner surface. The housing may be constructed to produce very nearly a 4 pi steradian collection system efficiency with respect to the scattered light.

3,614,232
PATTERN DEFECT SENSING USING ERROR FREE BLOCKING SPACIAL FILTER

Einar S. Mathisen, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 25, 1968, Ser. No. 778,526
Int. Cl. G01n *21/32*
U.S. Cl. 356—71 6 Claims

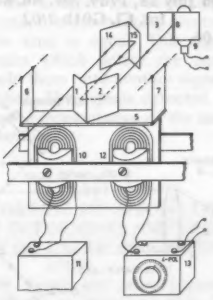


Defects in microcircuit patterns are sensed by illuminating the pattern with monochromatic collimated light. The illuminated pattern is imaged through a lens to produce substantially a two-dimensional optical Fourier transform of the pattern at a plane on the output side of the lens. An optical filter (transparency) which includes substantially the negative of the Fourier transform of a defect-free specimen of the microcircuit is placed at the aforesaid plane to block the optical frequency components corresponding to the defect-free specimen. Light passing through the filter is processed to provide various indications of the pattern defects.

3,614,233
DEVICE FOR LINEAR DISPLACEMENT OF A PLANE OPTICAL IMAGE IN ITS OWN PLANE

Nils Robert Dahr Aslund, Johanneshov, Sweden, assignor to Saab Aktiebolag, Linkoping, Sweden

Continuation of application Ser. No. 600,189, Dec. 8, 1966, now abandoned. This application May 8, 1970, Ser. No. 35,883
Int. Cl. G01j *3/06*
U.S. Cl. 356—83 8 Claims



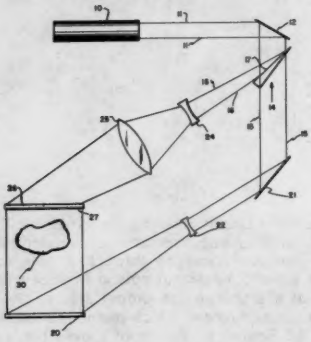
An optical apparatus for displaying spectral images is disclosed, the device including two reflecting planes fixed at right angles to each other but displaceable with respect to an image plane to permit a scanning of an optical image. Both reflecting planes are at a 45° angle with the image plane, and the line of intersection of the two reflecting planes oscillates in a direction which is transverse to the line of intersection of the reflecting planes, whereby the image is scanned sinusoidally past an opening in the image plane. A light-sensitive element behind the opening transforms the light into an electrical signal which corresponds in amplitude to the light intensity and which can be displayed on an oscilloscope. A sensing means tracks the swing movement, generating a signal which may be used as one coordinate axis of the oscilloscope display. A phase correction network is located between the sensing means and the oscilloscope so that the correct phase relationship between the oscillating swing and the display may be obtained.

3,614,234

FRINGE-GENERATING HOLOGRAPHIC SYSTEM

Lee O. Heflinger, Torrance, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed July 11, 1969, Ser. No. 840,908
Int. Cl. G01b 9/02; G02b
U.S. Cl. 356—106 8 Claims



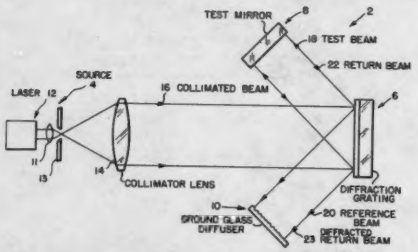
A double-exposure holographic system having means for producing finite fringes at the plane of an object. To this end a first hologram is made without the object and by passing the scene beam through a light diffuser. For the second exposure the object is inserted into the path of the scene beam. Alternatively the two exposures are taken with an object and then with the displaced or perturbed object. Also the light diffuser is rotated in such a manner that finite fringes appear at the plane of the object. The spacing between adjacent fringes may be controlled by the angle through which the diffuser is rotated.

3,614,235

DIFFRACTION GRATING INTERFEROMETER

Charles R. Munnerlyn, 20 Waterworks Lane, Fairport, N.Y.

Filed July 28, 1969, Ser. No. 845,385
Int. Cl. G01b 9/02
U.S. Cl. 356—106 20 Claims



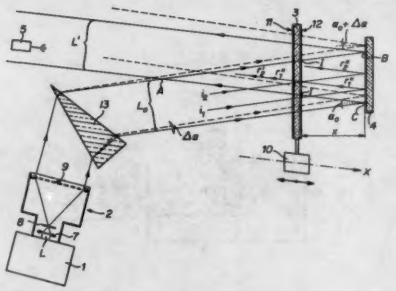
An interferometer, and preferably an infrared laser interferometer, employing a single, reflecting diffraction grating operating as both the beam splitter and the reference surface. A collimated beam from the radiation source is directed onto a surface of the diffraction grating and is diffracted into two separate beams, namely a test beam and a reference beam. The test beam is directed to the test optical system and is then reflected back, as a return beam, from the test optical system to the diffraction grating, at an angle such that a diffracted return beam is produced by the diffraction grating that coincides with the reference beam. An interference pattern is produced between the reference beam and the diffracted return beam, that can be observed, at the plane of observation, visually or recorded with an image recording device.

3,614,236

APPARATUS FOR MEASURING LENGTH BY OPTICAL INTERFEROMETRY

Adolf Steinemann, Moillesula, Geneva, and Jack Rufenacht, Lausanne, both of Switzerland, assignors to Societe Genevoise D'Instruments De Physique

Filed May 12, 1969, Ser. No. 823,652
Claims priority, application Switzerland, May 17, 1968, 7,408/68
Int. Cl. G01b 9/02
U.S. Cl. 356—112 4 Claims



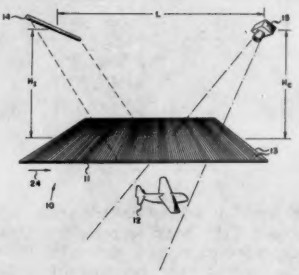
A broad laser beam is directed at a given slight angle of incidence onto a plane mirror for reflecting the beam to produce a zone of overlap. Interference fringes are produced on a linearly displaceable detecting surface arranged parallel to the mirror in the zone of overlap. The angle of incidence is corrected according to a given relation as a function of variations of the refractive index of the medium through which the incident and reflected beams pass, thereby to annul the effect of said variations.

3,614,237

METHOD AND APPARATUS FOR CONTOUR MEASUREMENT

Robert J. Kyle, Decatur, and Donald M. Meadows, Marietta, both of Ga., assignors to Lockheed Aircraft Corporation, Burbank, Calif.

Filed Jan. 21, 1969, Ser. No. 792,346
Int. Cl. G01b 11/24, 11/30
U.S. Cl. 356—120 12 Claims



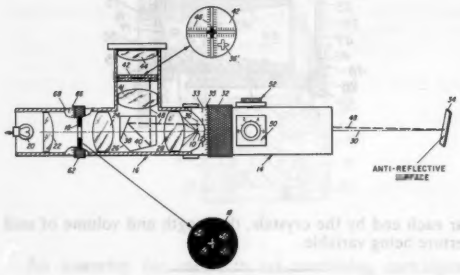
A technique for observing and measuring the contour of a surface with moire optical interference patterns. Illumination diverging from a source passes through a periodically repetitive image structure to cast a shadow image of such structure onto a surface being examined. The surface and the shadow image cast thereon are viewed through a periodically repetitive image structure to establish moire interference patterns. These moire interference patterns can be viewed as contour lines appearing on the surface and representing actual regions of equal elevation of the surface contour, and the actual increments of elevation between adjacent moire fringes can be determined.

3,614,238

BRIGHT LINE RETICLE APPARATUS AND OPTICAL ALIGNMENT METHODS

David G. Stites, Woburn, Mass., assignor to Itek Corporation, Lexington, Mass.

Filed Jan. 5, 1968, Ser. No. 695,988
Int. Cl. G01b 11/27
U.S. Cl. 356—124 15 Claims



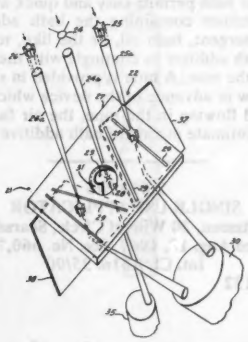
Apparatus for use with an alignment instrument. The apparatus includes a bright line reticle with a dark field background, condenser means for directing radiant energy through the bright line reticle, an alignment reference reticle representative of the reference axis and image projection and return means for projecting an image of the bright line reticle to the instrument and for receiving the projected image reflected back from the instrument and transmitting that reflected image to the reference reticle to provide a quantitative representation of the displacement between that reflected image and the reference reticle.

3,614,239

PHOTOELECTRIC SPACE-OBJECT POSITION MEASURING DEVICE

Kenneth E. Kissell, Dayton, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force

Filed Apr. 21, 1970, Ser. No. 30,424
Int. Cl. G01b 11/26
U.S. Cl. 356—152 11 Claims



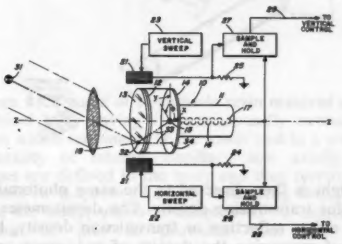
Satellite-position determining means for accurately locating the position of a spacecraft in near-earth orbit consisting of a satellite-tracking telescope; a first, fixed, star-detecting masking element mounted at the telescope focus, and including a central aperture and a plurality of slits formed in an M-shaped configuration for sequentially passing light from background stars to a first photomultiplier; and a second, rotatable, transparent disc element mounted at the central aperture and incorporating opaque radial and spiral bands for sequentially interrupting light passing from the satellite to a second photomultiplier. From the average time of the inner light pulses and the outer light pulses resulting from starlight received at the first photomultiplier, and the proportional time interval between the passage of starlight by the inner slits and the outer slits, the instant at which the image of the star passed midway through the M-configuration and the lateral location thereof relative to the ends of the slits may be computed. Then, by noting the elapsed time between the interruptions of light from the target-satellite to the second photomultiplier, the exact position of the satellite relative to the already-determined position of the star may likewise be computed.

3,614,240

OPTICAL TARGET POSITION INDICATOR

Conrad W. Brandts, Dahlgren; Eugene P. Stemple, King George, and Richard A. Frazer, King George, all of Va.

Filed May 21, 1969, Ser. No. 828,099
Int. Cl. G01b 11/26
U.S. Cl. 356—152 1 Claim



This invention is a circuit which produces electrical signals that describe the two-dimensional position of an image on the photocathode surface of a scannable photomultiplier. The photomultiplier is provided with deflecting coils and a masking electrode with a small aperture is spaced from the photocathode. When light from a distant target impinges on the photosensitive surface of the photomultiplier, an electron stream is emitted by the surface. The deflecting coils focus this stream on the aperture in the masking electrode to cause the photomultiplier to emit a signal. This signal activates sample-and-hold circuits which detect the outputs of the deflecting coils and hold them until another signal is received from the photomultiplier. The signals detected by the sample-and-hold circuits are representative of the target position as sensed by the photomultiplier.

3,614,241

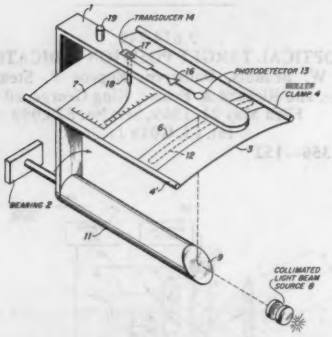
AUTOMATIC RECORDING DENSITOMETER WHICH SIMULTANEOUSLY DETERMINES AND RECORDS THE OPTICAL DENSITY OF A STRIP OF PHOTOGRAPHIC FILM

Lloyd Clifford Sanford, Acton, and John Augustus O'Brien, Reading, both of Mass., assignors to Itek Corporation, Lexington, Mass.

Continuation-in-part of application Ser. No. 582,065, Sept. 26, 1966, now Patent No. 3,518,013. This application June 19, 1970, Ser. No. 47,704
Int. Cl. G01j 3/50; G01n 21/22
U.S. Cl. 356—175 17 Claims

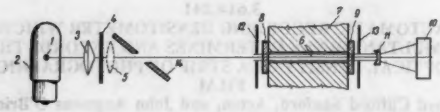
A densitometer which simultaneously determines and records the optical density of a strip of photographic film. The filmstrip is mounted on a first portion of a curved platen. A piece of graph paper is mounted on a second portion of the curved platen adjacent to the first portion. A unitary arm is mounted above the curved platen and moves in an arcuate path parallel to the surface of the support platen. The moving unitary arm scans the density of the film and simultaneously records the density on the graph paper. The second portion of the curved platen, on which the graph paper is mounted, has a larger radius of curvature than the first portion of the curved platen on which the film is mounted. The mechanical advantage of the larger radius enables the density to be

recorded on a graph having a longer abscissa than the length of the filmstrip. The densitometer has the capability of measuring both reflection and transmission density. For transmission density a light source is located in the unitary scanning arm and directs light through the filmstrip to a photomultiplier tube located below the filmstrip. The output of the photomultiplier tube is utilized to drive a recorder which plots the density on the graph paper. For reflection density a light source is located beneath the filmstrip and directs light against the lower surface of the filmstrip. The



reflected light is then directed to the same photomultiplier tube used for transmission density. The densitometer, while measuring either reflection or transmission density, has the capability of measuring the density of red, green, or blue colors in the filmstrip. This capability is added by having a cylindrical filter located around the photomultiplier tube. The cylindrical filter has green, red, and blue filter portions. The density of a particular color is measured by interposing that filter in the light path, thereby allowing only the light of that color to pass to the photomultiplier tube.

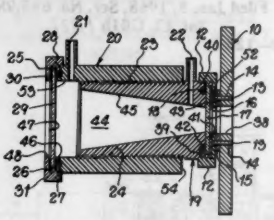
3,614,242
PHOTOELECTRIC PHOTOMETER
Jiri Hrdina, Praha, Czechoslovakia, assignor to Ceskoslovenska akademie ved, Praha, Czechoslovakia
Continuation of application Ser. No. 584,451, Oct. 25, 1966. This application May 6, 1970, Ser. No. 37,364
Int. Cl. G01j *3/46*
U.S. Cl. 356—181 **6 Claims**



A flow-through measuring cell is used on combination with an optical system which passes through the cell a light beam restricted to the central or core portion of the cell.

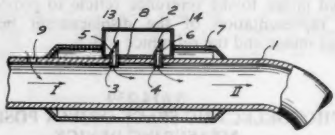
3,614,243
VARIABLE PATH-LENGTH GAS CELL
Robert J. Harvey, Ramsey, N.J., assignor to Reno A. Del Ben, Tenafly, N.Y., a part interest
Filed Aug. 1, 1969, Ser. No. 846,778
Int. Cl. G01n *1/10*
U.S. Cl. 356—246 **8 Claims**

A variable path-length gas cell which includes a base, an inner gas cell member coupled to said base, a crystal contained between the base and the inner gas cell member, an outer gas cell member movably mounted on the inner gas cell member, a second crystal mounted at an end of the outer gas cell member, and an aperture which runs from one end of the gas cell to the other end of the gas cell and is blocked



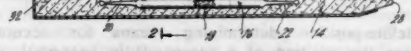
near each end by the crystals, the length and volume of said aperture being variable.

3,614,244
SHOWER BATH ATTACHMENT
Ignaz Eck, 145 Fuerstenriederstrasse, 8000 Munich 21, Germany
Filed Oct. 21, 1969, Ser. No. 868,136
Int. Cl. A46b *11/06*; **B05b** *7/26*
U.S. Cl. 401—28 **12 Claims**



A device provided at the pipe conducting a liquid to the rose of a shower bath permits easy and quick attachment of a pierceable container containing the bath additive such as liquid soap, detergent, bath oil, or the like, to the pipe and causing said bath additive to comingle with the liquid flowing in said pipe to the rose. A hole is provided in said pipe in the direction of flow in advance of the device which causes air to enter the liquid flowing in the pipe, the air facilitating foam formation and intimate mixing of bath additive and liquid.

3,614,245
SINGLE-USE APPLICATOR
Gilbert Schwartzman, 20 Wilmot Circle, Scarsdale, N.Y.
Filed Aug. 15, 1967, Ser. No. 660,733
Int. Cl. A61m *35/00*
U.S. Cl. 401—132 **1 Claim**



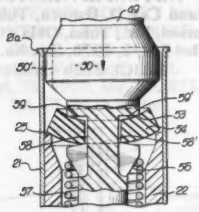
An applicator comprising an elongated rod-shaped pad of porous material. The pad has a conical-shaped pointed end. A fluid containing frangible capsule is embedded in the pad, a fluid-proof tubular envelope surrounds the pad and has an open end of a truncated conical shape. The pointed end of the pad extends beyond the conical open end of the envelope.

3,614,246

PRESSURIZING CONSTRUCTION

Lotfi H. Lotfallah, Hollywood, Calif., assignor to The Gillette Company, Santa Monica, Calif.

Filed Nov. 24, 1969, Ser. No. 879,253
Int. Cl. B43k 24/08, 7/02
U.S. Cl. 401—101 13 Claims



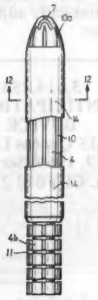
An assembly for use with ink-containing cartridges of writing instruments whereby a low-order pressure during writing automatically increases pressure on the ink in the cartridge while permitting the cartridge to vent to atmosphere when not in use. The assembly includes a movable element carrying a flexible and resilient washer, normally biased into venting position and provides air channels and sealing zones coacting with the washer for pressurizing. A writing instrument including a barrel and a project-retract mechanism as well as an ink-containing cartridge having a writing tip is also disclosed with the cartridge being provided with the assembly.

3,614,247

WRITING INSTRUMENT STRUCTURE

Katsumi Otsuka, Funabashi-shi, Chiba-ken, Japan, assignor to Teibow Company Limited, Hamamatsu-shi, Japan

Filed June 17, 1969, Ser. No. 834,045
Claims priority, application Japan, Dec. 10, 1968, Dec. 10, 1968, 43,107068;43,107069
Int. Cl. B43k 8/00
U.S. Cl. 401—199 9 Claims



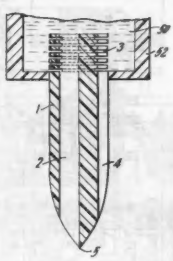
An improved nib for a writing instrument comprising a casing, an ink reservoir incased in the case, a nib holder rigidly engaged with a tip portion of the case and provided with an aperture for rigidly holding the nib. The nib of the present invention is provided with an inner capillary conduit having a lateral cross section of snowflake shape. The conduit of the nib is arranged along an axis thereof and a rear end thereof is inserted into the ink reservoir while a tip end portion thereof is extended outwards from the nib holder. The tip end portion of the nib is sharpened. Additional means for flowing ink from the ink reservoir to the tip of the nib, such as a plurality of outside capillary grooves etc. can be preferably applied to the nib.

3,614,248

PEN WICK MADE OF SYNTHETIC RESIN

Katsumi Otsuka, 1, Takanedai-cho 3-chome, Funabashi, Japan

Filed July 24, 1968, Ser. No. 747,179
Claims priority, application Japan, July 25, 1967, 43/59046
Int. Cl. B43k 8/00
U.S. Cl. 401—292 4 Claims



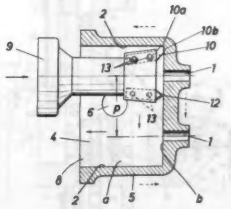
A pen wick made of a synthetic resin material comprises a cylindrical body having a lower inwardly curved transition portion which terminates at the lower end in a writing point. A plurality of internal capillary size axially extending passages are defined in the body and they terminate around the point in respective radially extending slots. The upper end of the body, which is adapted to be located within a reservoir of ink, is provided with one or more circumferentially extending grooves and the exterior of the body is provided with longitudinally extending grooves which intersect at their upper ends with the circumferential grooves and extend downwardly into closely spaced relationship to the slots. Ink is distributed to the point through the internal passages to the slots and an additional supply is directed form the circumferential grooves downwardly along the longitudinal grooves to the vicinity of the slots for supplying an additional supply of ink to the point.

3,614,249

METHOD OF FINISHING A DISPLACEMENT CHAMBER IN A ROTARY FLUID DEVICE

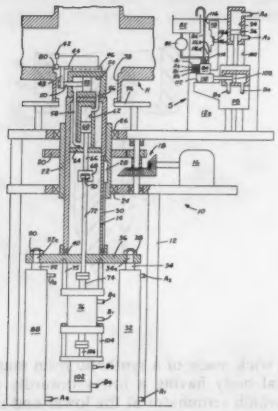
Masakatu Nishioka, Tokyo, Japan, assignor to Oval Kiki Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 13, 1969, Ser. No. 849,815
Claims priority, application Japan, Aug. 17, 1968, 43-58295
Int. Cl. B23b 35/00
U.S. Cl. 408—1 4 Claims



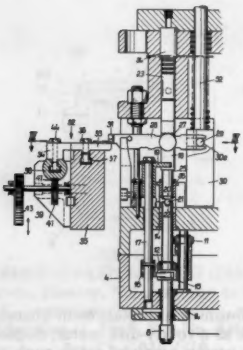
A method of finishing a displacement chamber in a rotary fluid device such as a rotary-disk meter, displacement pump and so on which carries a pair of rotors such as rotary disks, revolving gears. The displacement chamber comprises upright semicircular or semicylindrical wall sections and an oval-shaped bottom wall surface. These sections and surface are finished in a single cutting operation, utilizing a single finishing tool having at least two groups of bits provided on its driving shaft with a specific distance therebetween.

3,614,250
AUTOMATIC MACHINE TOOL
Walter L. Connolly, Orinda; Harold C. Andree, Orinda, and Ralph M. Harrison, Oakland, all of Calif., assignors to Grove Valve and Regulator Company, Oakland, Calif.
Filed June 19, 1969, Ser. No. 834,658
Int. Cl. B23b *39/26, 47/18*
U.S. Cl. 408—3 9 Claims



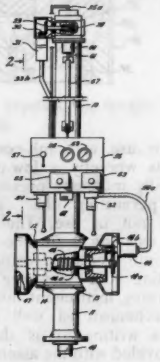
An automatic tool for machining interior surfaces of stationary work. A hollow shaft is rotated and moved axially, and a cutting member carried on a radial slide on one end of the shaft is moved by a push rod through an axial to radial motion transmitting device to vary the diameter of the bore. Axial movements of the push rod and shaft are delivered by input cylinders, the piston of which are connected to output sensing pistons which operate slave piston drive slides, indicating motion along two axes.

3,614,251
MULTISPINDLE CUTTING MACHINE TO PRODUCE HOLES IN SHEET METAL, FOR EXAMPLE SIEVE STRUCTURES
Emil Karl Witzig, Greutterwaldstrasse 19, Weilimdorf, and Rudolf Frank, Am Zuckerberg 41, Ludwigsburg, both of Germany
Filed June 24, 1969, Ser. No. 836,012
Claims priority, application Germany, July 4, 1968, P 17 52 711.6
Int. Cl. B23b *39/04*
U.S. Cl. 408—3 12 Claims



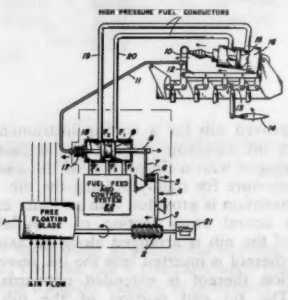
A cutting head, relatively positionable with respect to a table, carries a plurality of cutters. To disable selected cutters, for example to leave uncut spokes in a circular sieve structure, the cutters have holding arms connected thereto, which extend into a cam track path. Adjustable cams are positioned on the cam track, by means of a pattern or guide displaced with displacement of the positioning of table and cutter. The particular pattern position is sensed, and controls the positions of the cams on the cam track, so that selected holding arms will be engaged by the cams to disable cutting of predetermined, selected cutters.

3,614,252
TAPPING APPARATUS
Dillard L. Rose, and Coy D. Osburn, Tulsa, Okla., assignors to T. D. Williamson, Inc., Tulsa, Okla.
Filed Jan. 2, 1970, Ser. No. 218
Int. Cl. B23b *41/08*
U.S. Cl. 408—9 11 Claims



The tapping apparatus disclosed has a feed screw for moving a boring bar axially upon rotation of the boring bar relative to the feed screw. A drive sleeve rotates the boring bar to provide such relative rotation and to rotate a cutter attached to the boring bar to cause the cutter to cut a hole in a pressure vessel. Both the feed screw and the drive sleeve are rotated independently by fluid motors. The pressure of the fluid to each motor is maintained constant, after the initial relative rotation between the boring bar and the feed screw is established, to permit the feed rate of the cutter, i.e., the speed at which the boring bar is moved axially by the feed screw, to adjust itself automatically to decrease as the cutting load increases and increase as the cutting load decreases thereby automatically adjusting the feed rate to the cutting load on the cutter.

3,614,253
ENGINE STALL ANTICIPATION AND REACTION DEVICE
Robert M. Gaertner, 9315 Queens Lane, Oxen Hill, Md.
Filed May 29, 1969, Ser. No. 830,220
Int. Cl. F01d *27/02*
U.S. Cl. 415—23 8 Claims



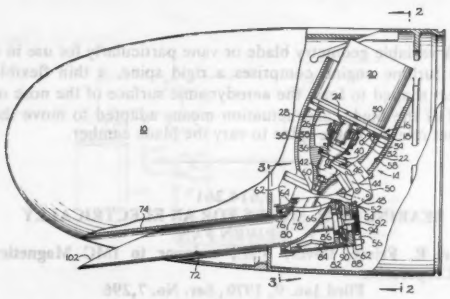
In a compressor operating near stall and utilizing the mechanism of variable pitch stator blades to prevent stall, a

floating stator blade is used to sense an imminent stall condition. The blade pivots like a weather vane in the airstream flow through the axial flow compressor. The attack angle differential between the variable pitch stator blades and the floating stator blade is sensed and utilized by electrical or fluid pressure means to change the attack angle of the variable pitch stator blades so as to prevent stall.

3,614,254
VARIABLE GEOMETRY, ROTARY VALVE, SPEED CONTROLLED TURBINE

Alfred E. Gabrys, Canoga Park, Calif., assignor to CCI Aerospace Corporation, Van Nuys, Calif.

Filed Oct. 30, 1969, Ser. No. 872,567
Int. Cl. F01b *25/06*
U.S. Cl. 415—36 **7 Claims**

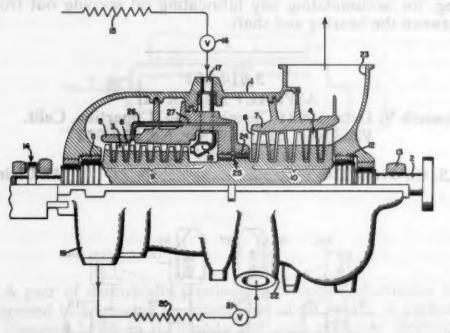


Apparatus for controlling the induction of motivating air into a turbine wherein a governing mechanism effects rotation of the air inlet tubes which is capable of simultaneously reducing the inlet capture area and changing the direction of airflow from the inlet tubes into the turbine.

3,614,255
THRUST BALANCING ARRANGEMENT FOR STEAM TURBINE

James J. H. Rooney, Jonesville, N.Y., assignor to General Electric Company

Filed Nov. 13, 1969, Ser. No. 876,363
Int. Cl. F01d *3/02*
U.S. Cl. 415—100 **4 Claims**

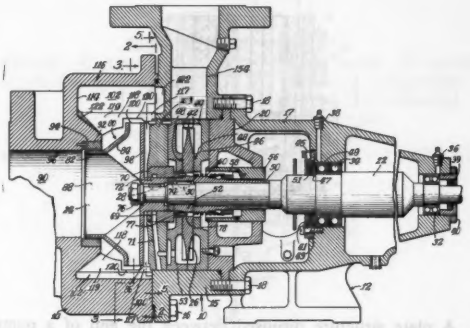


A thrust balancing piston in the midshaft packing of an opposed flow reheat steam turbine is supplied by a pipe connected to a downstream turbine stage. The thrust developed by the balance piston is small under normal operating conditions, but, under certain conditions of steam flow following valve closure, the piston compensates for loss of the thrust of one of the opposed flow turbine elements so as to reduce net thrust on the turbine shaft.

3,614,256
COMBINATION CENTRIFUGAL-TURBINE PUMP

Leonard J. Sieghartner, Coal Valley, Ill., assignor to Roy E. Roth Company, Rock Island, Ill.

Filed Mar. 19, 1970, Ser. No. 20,881
Int. Cl. F04d *11/00, 29/08*
U.S. Cl. 415—143 **6 Claims**

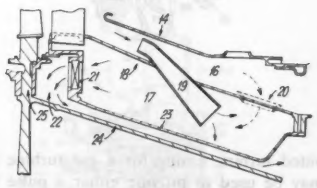


A centrifugal-turbine pump capable of pumping liquids at or near the boiling point with suction heads not greater than 1 foot having a pump casing with first and second pumping chambers laterally disposed and a drive shaft disposed axially of the pumping chambers. A high-pressure regenerative turbine impeller fixed for rotation with the driving shaft. The second pumping chamber extending angularly about the periphery of the turbine impeller and having a discharge opening radially from the turbine impeller. The casing having a suction entrance for the turbine stage opening laterally from the first pumping channel to the second pumping channel. A centrifugal impeller fixed for rotation within the first channel and with the drive shaft and turbine impeller.

3,614,257
GAS TURBINE ENGINE

David Alexander Campbell, Derby, England, assignor to Rolls Royce Limited, Derby, England

Filed July 16, 1970, Ser. No. 55,409
Claims priority, application Great Britain, July 19, 1969, 36458/69
Int. Cl. F01d *25/12, 5/08*
U.S. Cl. 415—176 **6 Claims**

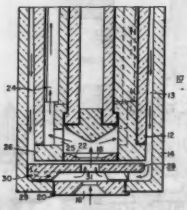


A gas turbine engine having means for reducing air frictional drag and consequent heating on a gas turbine engine compressor disc. High-pressure air is tapped from the main airflow of the engine adjacent the compressor disc and directed at an acute angle to the face of the disc. In this way a rotating mass of high-pressure air is produced adjacent to the face of the compressor disc thus cooling and reducing air frictional drag on the disc.

3,614,258
SCAVENGER PLATE FOR PUMP INLET

Paul H. Scheffler, and Jack L. McCabria, both of Lima, Ohio, assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 4, 1969, Ser. No. 813,411
Int. Cl. F04d 29/02, 3/02
U.S. Cl. 415—208 4 Claims

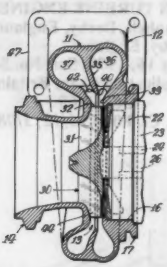


A plate structure disposed between the end of a pump rotor and an inlet port provided in an associated pump housing, the plate being effective to withdraw liquid from around the outside of the rotor when the rotor is rotated, and direct the liquid radially inwardly towards the axial center of the pump and rotor, and into the flow stream entering the rotor.

3,614,259
TURBINE CASING

Joseph J. Neff, Columbus, Ind., assignor to Cummins Engine Company, Inc., Columbus, Ind.

Filed Sept. 4, 1969, Ser. No. 855,270
Int. Cl. F01d 1/02; F01k 23/14; F01d 25/24
U.S. Cl. 415—205 4 Claims

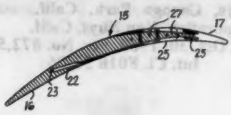


A divided turbine casing for a gas turbine is disclosed, which may be used to provide either a pulse turbine or a variable speed turbine. When used as a pulse turbine, two separate flows of pulsating gas are supplied to the divided inlet portion of the casing. The pulses in the respective flows are transmitted by the casing to the turbine wheel with minimum energy loss. When used as a variable speed turbine, a valve is provided in the inlet portion of the casing to direct gas supplied to the inlet portion into one or the other or both parts of the divided inlet to provide different ranges of gas velocity at the turbine wheel and consequently different ranges of turbine speed.

3,614,260
BLADES OR VANES FOR FLUID FLOW MACHINES

John H. Ellinger, Mickleover, Derby, England, assignor to Rolls Royce Limited, Derby, England

Filed Sept. 5, 1969, Ser. No. 855,668
Claims priority, application Great Britain, Sept. 12, 1968, 43367/68
Int. Cl. F01d 7/00
U.S. Cl. 416—23 7 Claims

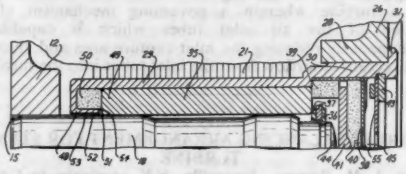


A variable geometry blade or vane particularly for use in a gas turbine engine comprises a rigid spine, a thin flexible sheet shaped to form the aerodynamic surface of the nose or tail of the blade, and actuation means adapted to move the sheet relative to the spine to vary the blade camber.

3,614,261
BEARING SEAL MEANS FOR AN ELECTRICALLY DRIVEN FAN

Karl E. Friese, Dover, N.H., assignor to IMC Magnetics Corporation

Filed Jan. 9, 1970, Ser. No. 7,296
Int. Cl. F04d 29/04; F16c 1/29
U.S. Cl. 416—174 7 Claims

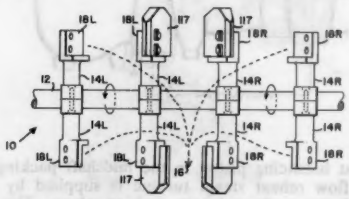


A tubular ferrule connects the fan impeller to the rotor of the fan motor. Fixed within the ferrule is a porous bearing rotatable about a shaft fixed to the fan frame. One end of the ferrule carries a cuplike member, within which may be a felt ring, for accumulating any lubricating oil seeping out from between the bearing and shaft.

3,614,262
ASPHALT MIXER TIP

Kenneth V. Lutz, 10081 Carmen Road, Cupertino, Calif.

Filed Nov. 24, 1969, Ser. No. 879,042
Int. Cl. B01f 7/04
U.S. Cl. 416—224 12 Claims



The present invention relates to tips for a heavy-duty mixer, said tips including a left side surface, a right side surface, a leading edge, a trailing edge surface and a top edge

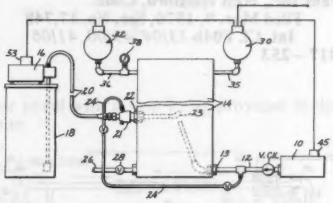
surface interconnecting the leading and trailing edge surfaces, and a bottom edge surface interconnecting the leading and trailing edge surfaces. The tip is symmetrical about a center plane intermediate the side surfaces and carries receiving means for receiving fasteners to secure the tip to a shank which receiving means are designed to receive a fastener from either the left or the right side surface areas, thereby providing a tip interchangeable between left and right arms of the mixer.

3,614,263

CHLORINATION CONTROL APPARATUS

Max E. Witt, 803 North Renville, Winthrop, Minn.

Filed Feb. 3, 1970, Ser. No. 8,324
Int. Cl. F04b 41/06
U.S. Cl. 417—7 8 Claims



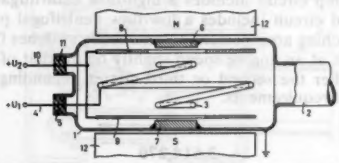
Apparatus for selectively controlling the injection of chlorine into a water pressure tank utilizing a mercury switch actuated by a Bourdon tube for commencing and terminating the chlorine injection at pressures which are correspondingly greater than and less than the pressures at which the water flow into the pressure tank commences and terminates.

3,614,264

IONIZATION GETTER PUMP

Karl-Georg Gunther, Nurnberg, Germany, assignor to Siemens Aktiengesellschaft, Erlangen, Germany

Filed June 5, 1959, Ser. No. 818,322
Claims priority, application Germany, June 6, 1958,
Int. Cl. F04f 11/00
U.S. Cl. 417—49 5 Claims



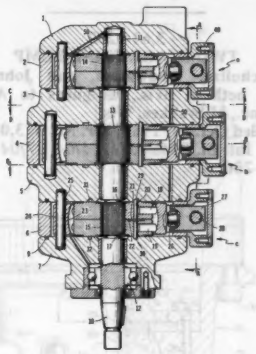
A pair of electrically conducting collector electrodes are disposed in a housing on either side of an anode. A cathode is disposed between the anode and each collector electrode and insulated from each. Each of the cathodes comprises a getter substance. The space between the anode and each of the cathodes defines a discharge space. Cathode-sputtering voltage is applied between the anode and the cathodes. A magnetic field is impressed upon the discharge space and has field lines extending from one collector electrode toward the other. Each of the cathodes defines at least one aperture therein having an axis parallel to the magnetic field lines and through which ions from the discharge space and material sputtered from the cathodes pass to the collector electrodes.

3,614,265

RADIAL PISTON PUMP

Carl V. Ohrberg, Nordborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Filed Jan. 15, 1970, Ser. No. 3,084
Claims priority, application Germany, Feb. 17, 1969, P 19 07 840.1
Int. Cl. F04b 23/04, 19/00; F01b 1/06
U.S. Cl. 417—62 2 Claims



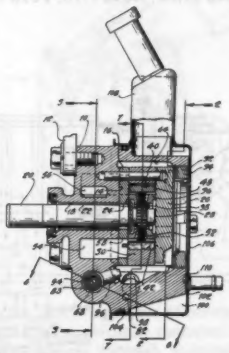
The invention relates to a multistage radial piston pump assembly. The assembly has two or more spaced-apart piston carriers attached to a shaft, the piston carriers having radially disposed cylinders with pistons disposed therein. A pivotally adjustable track carrier surrounds each piston carrier. Casing parts between each adjacent pair of piston carriers each has passages in fluid communication with the inlet and outlet ports of the assembly. At least one of these casing parts has the passages thereof in fluid communication with each of the piston carriers on opposite sides thereof through the sidewalls of the casing part. Regulatory means are provided for a three-stage assembly so that the eccentricity of the track carrier surrounding the middle piston carrier is always in the opposite direction of the eccentricities of the other two track carriers relative to the other two corresponding piston carriers.

3,614,266

COMPACT POSITIVE DISPLACEMENT PUMP

Fred A. Ciampa, Birmingham, and Sergio J. Mazzola, Dearborn, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 24, 1969, Ser. No. 887,950
Int. Cl. F04b 23/04, 49/00
U.S. Cl. 417—79 3 Claims



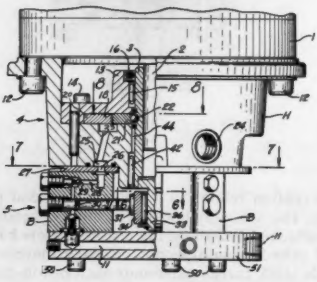
A positive displacement pump adapted especially for pumping oil in a power steering system for an automotive

vehicle, said pump comprising a rotor, slipper elements in the rotor engageable with the cam surface of a relatively stationary pump cam, a pump body surrounding the cam and having internal cavities which define a high-pressure outlet region, the low-pressure fluid inlet region of the pump being defined by other parts of the stationary housing, a reservoir surrounding the pump body and cooperating with a pump pressure plate which is subjected to a supercharge pressure obtained by the velocity pressure of fluid bypassed from a fluid control valve situated in the pump body.

3,614,267
TWO-STAGE FLUID PUMP

Eckart F. Schultze, Wauwatosa, and John R. Schultz, Milwaukee, both of Wis., assignors to Applied Power Industries Inc., Milwaukee, Wis.

Filed Oct. 31, 1969, Ser. No. 873,023
Int. Cl. F04b *23/12, 1/04, 27/04*
U.S. Cl. 417—206 **1 Claim**

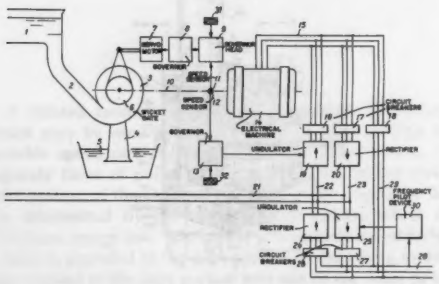


A two-stage pump assembly in which one of the pumping elements is a Gerotor pump and the other pumping element is a radial piston pump. The Gerotor pump acts to charge the radial piston pump and also acts as a first stage high-flow pump. Both pumps can operate together to produce a combined flow, and the Gerotor pump can be unloaded to divert its flow and thereby permitting the radial piston pump to act as a first stage pumping unit. Individual and replaceable pump bodies are provided for the piston type pump.

3,614,268
HYDRO-ELECTRIC INSTALLATION

Adrien Merenda, Clarens, Switzerland, assignor to Ateliers de Constructions Mecaniques de Vevey S.A., Vevey (Vaud), Switzerland

Filed Oct. 13, 1969, Ser. No. 865,659
Claims priority, application Switzerland, Apr. 24, 1969, 6,213/69
Int. Cl. F04b *41/04;* **H02k** *7/18;* **F01d** *15/10*
U.S. Cl. 417—237 **9 Claims**

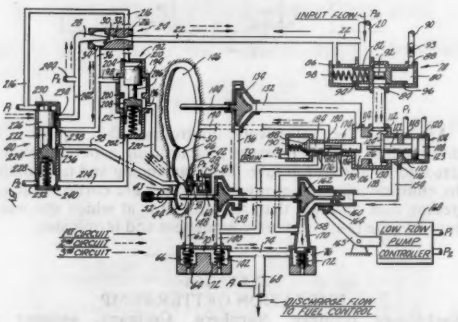


A hydroelectric installation, comprising a hydraulic machine, such as a turbine, pump or pump turbine, wherein the rotor is coupled to the shaft of a synchronous alternating current electrical machine operating as an alternator, or as a motor. When operating as a turbine, the installation includes at least one set of rectifiers transforming the alternating current produced by the alternator into direct current. When operating as a pump, the installation includes at least one undulator transforming the direct current supplied by the electric line into alternating current and supplying the motor. In both instances the installation comprises a pilot device controlling the mechanism regulating the quantity of water flowing through the turbine, or the frequency of the current output of the undulator to maintain at any instant, the predetermined speed of rotation of the rotor of the machine regardless of the value of the hydraulic head existing at that moment.

3,614,269
INTEGRATED PUMP-CONTROL SYSTEM USING A UNITIZED PUMP

Robert S. Lanctot, Long Meadow, Mass., assignor to Chandler Evans Inc., West Hartford, Conn.

Filed Mar. 9, 1970, Ser. No. 17,748
Int. Cl. F04b *23/04, 49/00, 41/06*
U.S. Cl. 417—253 **26 Claims**



An integrated fuel pump and control system has a unitized pump which includes three pumping circuits. A first pump circuit includes a positive displacement gear pump to provide fuel to a gas turbine engine from startup to just below idle. A second pump circuit includes a high-flow centrifugal pump, and a third circuit includes a low-flow centrifugal pump. A pump switching arrangement automatically switches from the first circuit at an engine speed slightly below that of ground idle to either the second or third circuit depending on the engine fuel requirements.

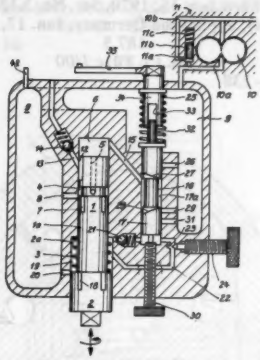
3,614,270
FUEL INJECTION PUMP FOR INTERNAL-COMBUSTION ENGINES

Horst Franke, Hofherrenweiler-Aalen, and Erich Dobler, Ulm-Herlingen, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed July 21, 1970, Ser. No. 56,865
Claims priority, application Germany, Aug. 8, 1969, P 19 40 372.6
Int. Cl. F04b *49/00;* **F02d** *1/02, 1/06*
U.S. Cl. 417—293 **5 Claims**

A fuel injector pump having a bypass from the pump chamber to a peripheral notch on a slide valve establishing connection to the suction chamber when the notch uncovers either one of two outlet ports. The notch is delimited by inclined edges and the slide valve is adjustable angularly and driven in synchronism with the main pump, whereby bypass intervals, during which no injection occurs, appear in the

initial and terminal phase of each stroke with a duration depending on the angular position, which is controlled by the



'accelerator pedal with a stop being provided in dependence on the r.p.m.

ERRATUM

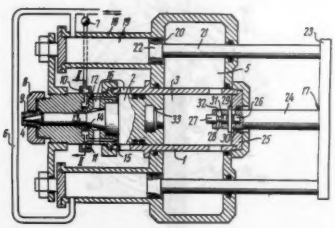
For Class 417,312 see:
Patent No. 3,614,384

3,614,271

DEVICE FOR BUILDING UP FLUID PRESSURE PULSES

Vladimir Semenovich Muchnik, Kemerovskoi oblasti, ulitsa Michurina 5, kv. 29; German Petrovich Chermensky, Kemerovskoi oblasti, ulitsa Nevskago 4, kv. 3; Mikhail Andreevich Nikiforov, Kemerovskoi oblasti, ulitsa Kirova, 33, kv. 19, and Jury Vladimirovich Gaiduk, Kemerovskoi oblasti ulitsa Shkolnaya, 21, kv. 13, all of Novokuznetsk, U.S.S.R.

Filed Oct. 30, 1969, Ser. No. 872,534
Int. Cl. F04b *17/00*
U.S. Cl. 417—379 **3 Claims**



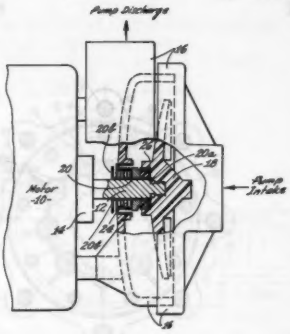
A device for building up fluid pressure pulses comprises a cylinder and a piston which divides the cylinder cavity into two chambers. The first of these chambers communicates with a compressed gas vessel while the second one is filled with fluid and has a hole for the discharge of the fluid under pressure when the fluid is struck upon by the piston which is accelerated by the compressed gas in the first chamber, the second chamber being in constant communication with the fluid supply line through a number of channels in the sidewall of the cylinder, some of these channels being arranged tangentially to the chamber and inclined with respect to the axis of the discharge hole while the remainder of these channels are arranged radially and also inclined relative to the axis of the hole.

3,614,272

PUMP ASSEMBLY

Richard O. Lightfoot, Pacific Palisades, and John J. Kunzweiler, Colton, both of Calif., assignors to HPE, Inc., Colton, Calif.

Filed Feb. 2, 1970, Ser. No. 7,934
Int. Cl. F04b *35/04;* **F03b** *11/00*
U.S. Cl. 417—423 **5 Claims**



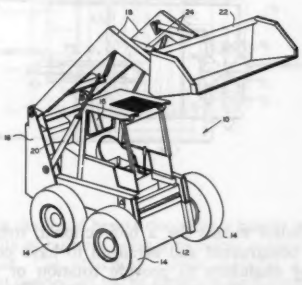
A pump assembly is provided which is constructed to prevent any possibility for the liquid passing through the pump to receive an electric charge due to defects in the insulation of the pump motor. The housing and impeller of the pump may be constructed, for example, of an insulating plastic material, and a sleeve of an insulating plastic material is mounted on the portion of the aforesaid shaft extending into said pump housing so as to insulate the shaft from the liquid within the pump housing. The sleeve also has an integral shoulder outside of the pump housing which extends radially outwardly and the shoulder exerts a centrifugal force on any liquid which may leak from the pump housing so as to prevent such liquid from entering the motor bearings.

3,614,273

MECHANISM FOR CONTROLLING THE BOOM ARMS AND BUCKET OF A FRONT END LOADER

Gersen L. Wallace, Fargo, N. Dak., assignor to Clark Equipment Company

Filed Jan. 26, 1970, Ser. No. 5,755
Int. Cl. B66f *9/00*
U.S. Cl. 214—778 **6 Claims**



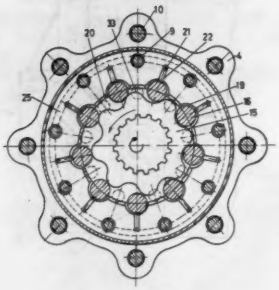
Mechanism for operating a pair of boom arms at one speed and operating a bucket pivotally mounted on the boom arms at two different speeds through manipulation of a single control handle. The mechanism includes a first valve connected to the control handle and second and third valves connected by linkage to the control handle for sequential operation.

3,614,274

HYDRAULIC ROTARY PISTON MACHINE

Carl V. Ohrberg, Havnbjerg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Filed June 15, 1970, Ser. No. 46,280
Claims priority, application Germany, June 19, 1969, P 19 31 143.4
Int. Cl. F01c *1/02*; F03c *3/00*; F04c *1/02*
U.S. Cl. 418—61 6 Claims



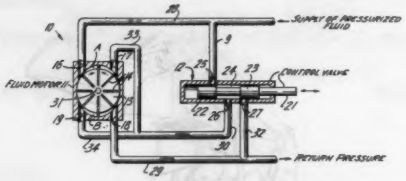
The invention relates to a rotary piston machine of the type having an externally toothed star member and a surrounding internally toothed ring member. The star and ring members have cooperably engaging teeth and are eccentrically offset relative to each other. The ring member teeth are in the form of rotatable rollers which are journaled in casing portions on opposite sides of the ring member. The ring member has slots in radially aligned and surrounding relation to the rollers and plates in the slots are biased into sealing engagement with the rollers by spring means and/or hydraulic means.

3,614,275

CONTROL MEANS FOR BIDIRECTIONAL ROTARY FLUID MOTOR SYSTEM

Richard S. Eibsen, Hillsdale, N.J., assignor to Curtiss-Wright Corporation

Filed Nov. 13, 1969, Ser. No. 876,247
Int. Cl. F01c *1/18, 11/00, 21/12*
U.S. Cl. 418—206 7 Claims



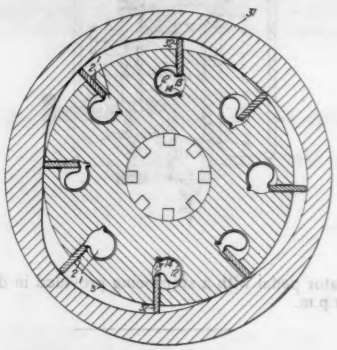
A control means for a bidirectional, rotary fluid motor means constructed and arranged to have porting and fluid working chambers to provide rotation of a rotor in one direction or the opposite direction. The control means comprises a control valve connected to communicate with the fluid motor means and a pressurized fluid supply means and a fluid exhaust or return means so that pressurized fluid fills or "floods" the fluid motor, including the ports and working chambers, in the neutral or null position of the control valve to thereby cause equal and opposite torque forces on the rotor and prevent rotation of the latter, and in another operative position of the valve effect an imbalance of torque forces on the rotor so as to cause rotation of the rotor in one direction or the other with a minimum time lapse.

3,614,276

ROTARY VANE PUMP

Hans Erdmann, Neu-Isenburg, Germany, assignor to Industrial Electronic Hardware Corp., New York, N.Y.

Filed Jan. 15, 1970, Ser. No. 3,136
Claims priority, application Germany, Jan. 17, 1969, P 19 02 187.5
Int. Cl. F01c *1/00*
U.S. Cl. 418—238 5 Claims



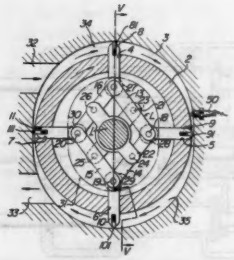
A rotary sliding vane machine in which the vane springs are positioned in chambers under the vane guide slots which are eccentrically arranged with respect to the guide slots. The springs may be either curved strip springs or cylindrical helical springs.

3,614,277

VANE-TYPE ROTARY ENGINE

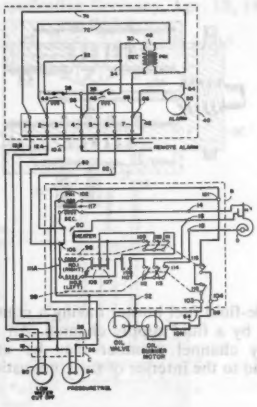
Akira Kobayashi, Nagoya, Japan, assignor to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi-ken, Japan

Filed May 11, 1970, Ser. No. 36,130
Claims priority, application Japan, May 14, 1969, 45/37115
Int. Cl. F01c *1/00, 21/00*
U.S. Cl. 418—253 1 Claim



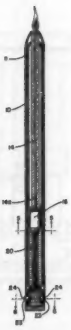
A rotary engine having the following construction. A rotor rotating in an elliptic cylinder is provided with four radial slots and a vane is slidably inserted through each of said slots with the root thereof pivotally connected to each apex of a quadrilateral linkage disposed in said cylinder. When the vane rotates while being carried by the rotor, the movement of the pivot point at the root of each vane is so regulated as to draw a common elliptical locus and, as a result, the tips of each vane moves while drawing a common elliptical locus. The inner peripheral surface of the cylinder in sliding engagement with the tip of each vane is shaped in an elliptical configuration conforming to the locus drawn by the tips of the vanes. By constructing as described above, the friction between the tip of each vane and the inner peripheral surface of the cylinder can be minimized and a stable high-speed running of the engine can be obtained.

3,614,278
ALARM CIRUIT
Charles J. Di Noto, Jr., 103 West Passaic Ave., Rutherford, N.J.
Filed Mar. 9, 1970, Ser. No. 17,769
Int. Cl. F23n *5/24*
U.S. Cl. 431—16 3 Claims



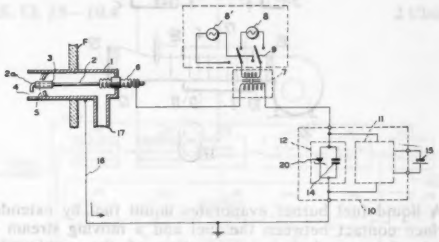
A relay circuit, in combination with malfunction controls of a domestic heating system (oil burner) energized by a standard primary control whereby on a malfunction such as low water level, in addition to the shutoff of the oil burner, an alarm circuit is operated for an aural or visual signal.

3,614,279
LIFETIME CANDLE INCLUDING FUEL SUPPLY INDICATING MEANS THEREFOR
Reynold E. Schenke, Paradise, Pa.
Filed Jan. 8, 1970, Ser. No. 1,514
Int. Cl. F23d
U.S. Cl. 431—17 3 Claims



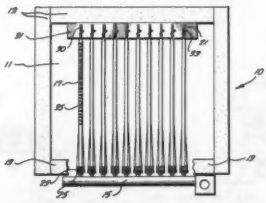
An improved lifetime candleholder having the general configuration of a candle wherein means are provided for urging the candle to the upper portion of the holder so that the entire candle may be consumed. The improvement consists essentially in means to indicate that the candle has been nearly consumed.

3,614,280
IGNITION AND FLAME DETECTION SYSTEM UTILIZING A SINGLE ELECTRODE
Tamio Yamaguchi, Chigasaki, Japan, assignor to Tokyo Gas Company Limited, Tokyo, Japan
Filed Dec. 22, 1969, Ser. No. 886,821
Claims priority, application Japan, Dec. 27, 1968, Jan. 13, 1969, 44/366;44/46562
Int. Cl. F23n
U.S. Cl. 431—25 2 Claims



A single electrode is positioned adjacent a burner in a furnace. A single circuit supplies current to create an arc across the electrode to the burner to ignite the furnace. The same circuit detects a DC current from the electrode to the burner due to the electric conductivity of the flame. The circuit includes means to shunt any AC current from the detector. An insulation material covers the electrode adjacent the arc-creating end to stabilize the DC current.

3,614,281
DETACHABLE BURNER ASSEMBLY
Robert M. Ramey, North Hollywood, Calif., assignor to Teledyne, Inc., Los Angeles, Calif.
Filed July 24, 1969, Ser. No. 844,488
Int. Cl. F23d *13/24*
U.S. Cl. 431—180 5 Claims



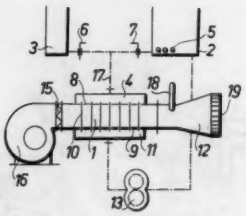
The invention disclosed herein describes a burner assembly having a plurality of burners being detachably connected to a burner manifold. The attaching means includes a spring-biased grommet connected to the mouth of each burner, each grommet having an annular portion adapted to be snapped into engagement with an annular groove of a respective gas jet which, in turn, is threadedly connected to the burner manifold. The other end of each burner includes a flanged end that is insertable into a slot formed within a support bar located on the rear side of the combustion chamber. To remove a burner from the assembly the rear end of the burner is lifted out of the slot in the support bar; then the mouth of the burner is detached from the gas orifice, thereby permitting easy service access to the individual burners and their respective gas jets.

3,614,282

METHOD AND APPARATUS FOR BURNING LIQUID FUELS

Laszlo Gabor, Budapest, Hungary, assignor to Nikex Nehezipari Kulkereskedelmi Vallalat, Budapest, Hungary

Filed Apr. 18, 1969, Ser. No. 817,419
Claims priority, application Hungary, Apr. 20, 1968, GA-897
Int. Cl. F23d 13/14
U.S. Cl. 431—328 3 Claims



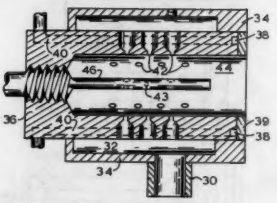
A liquid fuel burner evaporates liquid fuel by extended surface contact between the fuel and a moving stream of combustion gas before introduction of the combustible mixture into a combustion chamber. Unevaporated fuel may be recirculated, and the combustion gas may be heated prior to contact with the fuel, as by admixture with a portion of flue gases.

3,614,283

HIGH COMBUSTION RATE BURNER

Allan C. Morgan, Winchester, Mass., assignor to Cabot Corporation, Boston, Mass.

Filed June 27, 1966, Ser. No. 560,555
Int. Cl. F23d 15/02
U.S. Cl. 431—352 2 Claims



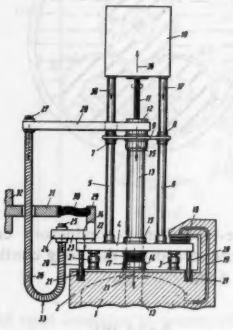
A multiple-fluid fuel burner having a combustion chamber surrounded by a fluid supply channel. An axially extending fluid supply channel member may be used to supply a reactant fluid to the interior of the combustion chamber.

ELECTRICAL

3,614,284
MELTING FURNACE WITH MOVABLE CURRENT CARRYING LEADS FOR A CONSUMABLE ELECTRODE

Helmut Scheidig, Rossdorf; Alfred Hauff, Bruchkobel, and Uwe Reimpell, Bruchkobel, all of Germany, assignors to Leybold-Heraeus-Verwaltung G.m.b.H., Koln-Bayental, Germany

Filed Jan. 30, 1970, Ser. No. 6,995
Claims priority, application Germany, Apr. 10, 1969, P 19 18 713.4
Int. Cl. H05b 7/12; F27d 11/10
U.S. Cl. 13—13 5 Claims

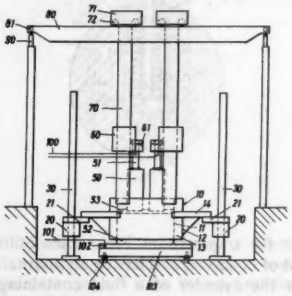


A melting furnace using consumable electrodes furnished with movable current supply leads and a sensitive device for continuously weighing the weight of the electrode and accordingly controlling the electrode feeding movement.

3,614,285
INSTALLATION FOR PRODUCING LARGE BLOCKS OF METALS THROUGH ELECTROSLAG REMELTING

Wolfgang Holzgruber; Otmar Kleinhagauer, and Hermann Geltewa, all of Kapfenberg, Austria, assignors to Gebr. Boehler & Co. AG, Kapfenberg, Austria

Filed May 27, 1970, Ser. No. 40,810
Claims priority, application Austria, May 27, 1969, 4974/69
Int. Cl. H05b 3/60, 7/12
U.S. Cl. 13—14 7 Claims

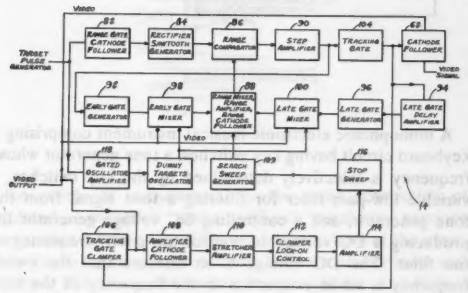


An installation for producing large blocks of metals through electroslag remelting. A plurality of electrodes are disposed vertically with their lower ends dipping into a liquid cooled mold, the electrodes being mounted on individually vertically adjustable electrode holders. Pair of electrode holders are supported on rails for adjustment toward and away from each other, the rails themselves being adjustable toward and away from each other. The installation permits the electrodes to be disposed in an optimum manner to fit mold cavities of various shapes. Mold lifting means may be provided whereby tall metal blocks may be produced.

3,614,286
RADAR PRESENTATION SIMULATOR

George M. Trinite, Jr., Sykesville, Md.

Filed May 10, 1963, Ser. No. 279,641
Int. Cl. G01s 9/00
U.S. Cl. 35—10.4 2 Claims

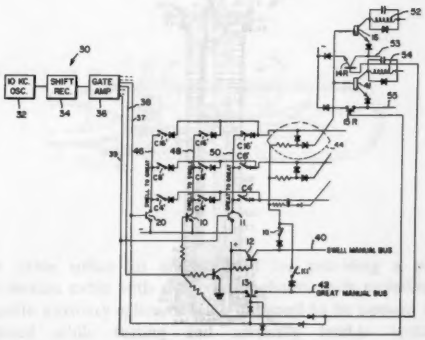


This invention relates to the simulation of radar systems and more particularly to the simulation of radar systems showing representations of aircrafts in typical flight paths.

3,614,287
MULTIPLEXING ARRANGEMENT FOR ELECTRONIC ORGANS

Paul A. Klann, P.O.Box 2398, Waynesboro, Va.

Continuation-in-part of application Ser. No. 753,978, Aug. 20, 1968. This application Aug. 15, 1969, Ser. No. 859,217
Int. Cl. G10h 1/00
U.S. Cl. 84—1.01 7 Claims



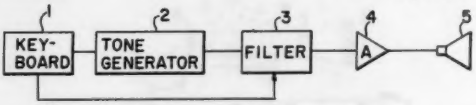
A single diode keying arrangement is connected for use with a plurality of keyboards, pedals, stop knobs and other switch operating instrumentalities on a time sharing basis by means of a sequential pulsing arrangement.

3,614,288

MONOPHONIC ELECTRONIC MUSICAL INSTRUMENT WITH VARIABLE FILTER

Takehisa Amano, Hamamatsu-shi, Japan, assignor to Nippon Gakki Seizo Kabuskiki Kaisha, Hamamatsu-shi, Japan

Filed July 17, 1969, Ser. No. 842,547
Claims priority, application Japan, July 19, 1968, 43/50567
Int. Cl. G10h *1/02*
U.S. Cl. 84—1.21 5 Claims



A monophonic electronic musical instrument comprising a keyboard circuit having key switches, a tone generator whose frequency is selectively determined by the key switches, a variable low-pass filter for filtering a tone signal from the tone generator, and a controlling DC voltage generator for producing a DC voltage to control the cutoff frequency of the filter. The DC voltage is so selected that the cutoff frequency is set in proportion to the frequency of the tone generator. Thus, flute tone signals of the same tone volume and color are obtained throughout the whole gamut of the instrument.

3,614,289

TERMINATION AND JOINT FOR TAP-PROOF CABLE

Erich W. Kothe, White Plains, and Andrew C. Laird, Hastings-on-Hudson, both of N.Y., assignors to Anaconda Wire and Cable Company

Filed Jan. 3, 1964, Ser. No. 335,518
Int. Cl. H02g *15/22, 15/24*
U.S. Cl. 174—19 11 Claims

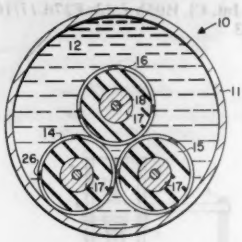
Our invention relates to cable terminations and joints and particularly to terminations and joints for tap-proof communication cables.

3,614,290

PIPE-TYPE CABLE COMPRISING ALUMINUM CONDUCTORS WITH HIGH-ELASTIC-MODULUS TENSILE STRANDS

Walter J. Plate, Rye, N.Y., assignor to Anaconda Wire and Cable Company

Filed Mar. 25, 1970, Ser. No. 22,460
Int. Cl. H01b *9/06*
U.S. Cl. 174—26 R 9 Claims



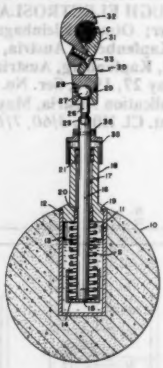
Aluminum pipe-type cable conductors comprise high elastic-modulus core strands so that long continuous lengths can be pulled into a pipe.

3,614,291

TRANSMISSION LINE CABLE DAMPER

John Pullen, Wilton, Conn., assignor to Burndy Corporation

Filed Aug. 14, 1969, Ser. No. 850,191
Int. Cl. H02g *7/14*; F16f *7/10*
U.S. Cl. 174—42 12 Claims



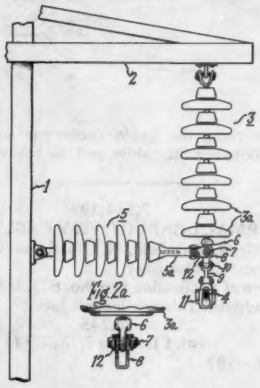
A damper for transmission line cables utilizes an outer body formed of concrete, and having an internal opening that functions as the cylinder of a fluid containing dashpot. A piston in the dashpot cylinder supports the weight of the concrete body through the intermediary of a spring in the cylinder, and a piston rod is fixed to the piston and extends out of the concrete body to be secured to a cable whose motion is to be damped. In a modification, the subassembly of a dashpot comprising a piston and piston rod, a spring and a fluid containing cylinder, is inserted into an opening of a weight mass formed of concrete, and the cylinder becomes an integral part of said weight mass.

3,614,292

STRUT INSULATOR CONNECTOR

Russell E. Volker, Baltimore, Md., assignor to General Electric Company

Filed June 11, 1970, Ser. No. 45,288
Int. Cl. H01b 17/10; H02g 7/20
U.S. Cl. 174—45 R 8 Claims



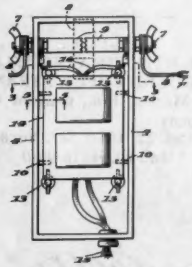
Outer end of strut insulator is connected to lower end of suspension insulator string by a clevis-eye connector whereby the strut insulator can be readily detached without removing the conductor clamp also connected to the bottom of the suspension insulator string.

3,614,293

ELECTRIC FENCE CONTROLLER

A. C. Boyd, Knoxville, Tenn., assignor to Fi-Shock, Inc., Knoxville, Tenn.

Filed Feb. 13, 1970, Ser. No. 11,055
Int. Cl. H05c 1/02; H05k 5/00
U.S. Cl. 174—52 R 7 Claims



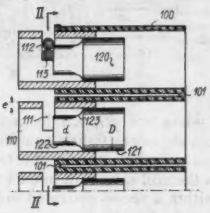
An electric fence controller having a plastic case for enclosing the power transformer. The transformer is mounted in the case, spaced from the surrounding sides, top and bottom thereof, being seated upon shoulders provided on flange support members which serve both to confine the transformer transversely of the case and as supports. The cover has depending pins which engage the transformer at the opposite side from the shoulders, thus confining the transformer on the latter and retaining it in place. Posts are also mounted in the case, spaced at intervals about the transformer to confine it lengthwise in position. These supporting parts are formed in one integral piece with the adjacent parts of the plastic case.

3,614,294

DEVICE FOR RAPIDLY INTERCONNECTING TWO INSULATED ELECTRICAL CONDUCTORS

Jean LeRouzic, Boulevard d'Armor Batiment No. 4, and Guy J. Mascarin, No. 212, Batiment G2, Z.U.P., both of Lannion, France

Filed Mar. 17, 1970, Ser. No. 20,325
Claims priority, application France, Mar. 20, 1969, 6908037
Int. Cl. H02g 15/08
U.S. Cl. 174—84 S 2 Claims



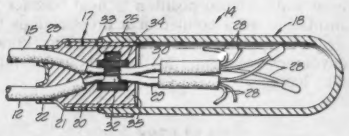
An article of manufacture for the rapid connection of insulated conductive wires without requiring previous preparation or stripping of the insulation to bare of the wires, the wires being clamped between a hollow metal cylinder and a piston slidable in the hollow metal cylinder; the hollow metal cylinder being formed with a radial slot extending substantially over half its diameter and this slot receiving the wires to be connected. The piston is moved to bend the wires and simultaneously tear the insulation thereof and thereby bring the wires into contact with one another. A hollow plastic cylinder surrounds the back portion of the cylinder and the piston and serves as insulation for the connection.

3,614,295

CABLE SPLICE KIT AND METHOD OF USE IN MAKING BRANCHOUT SERVICE CONNECTIONS

George W. Gillemot, 2331 20th St., Santa Monica, Calif., and John T. Thompson, 244 Laring St., Los Angeles, Calif.

Filed Oct. 6, 1969, Ser. No. 864,065
Int. Cl. H02g 15/08; H01b 13/00
U.S. Cl. 174—87 8 Claims



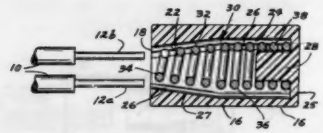
A cable splice kit and method for providing a main distribution cable with service branchouts each including a separate auxiliary splice housing designed to be opened and reclosed while testing and servicing lead-in splicing operations without need for disturbing the main cable branchout splice. The branchout cable includes extra conductors spliced to the conductors of the main cable and available for connection to the lead-in cable when and as need arises. The branchout and service cables have electrical shields which are secured together in an area imbedded in potting compound at one end of the auxiliary splice housing.

3,614,296

WIRE CONNECTOR WITH FRUSTOCONICAL GRIPPING SPRING

John H. Blomstrand, 214 Hazel Drive, Corona Del Mar, Calif., and Frederick W. Nyquist, 3318 Via Lido, Newport Beach, Calif.

Filed Dec. 24, 1969, Ser. No. 887,901
Int. Cl. H02g 15/08
U.S. Cl. 174—87 9 Claims



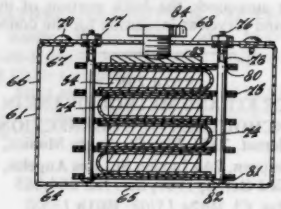
A plurality of wires are gripped by a frustoconical coil spring which forces the wires tightly against surface portions formed on a rigid member having substantially the same degree of taper as the coil spring. In one embodiment the coil spring is placed within a recess provided in the rigid member and in a second embodiment the spring encircles the rigid member.

3,614,297

ELECTRICAL CONDUIT SYSTEM

Elmer T. Carlson, Center Valley, Pa., assignor to Broadhill Development Corporation, Hartford, Conn.

Continuation-in-part of application Ser. No. 769,485, Oct. 22, 1968, now Patent No. 3,504,097, dated Mar. 31, 1970. This application Aug. 8, 1969, Ser. No. 848,541
Int. Cl. H02g 15/08
U.S. Cl. 174—88 B 7 Claims



A stack of insulated electrical conductors of rectangular external contour, each conductor preferably consisting of strip laminations, extends through a conduit which has an open position and a closed position in heat transfer relation with the insulation. In a connector a press clamps together overlapping end portions of corresponding conductors. Conduit envelopes are joined at the ends and conduits are suspended by hangers.

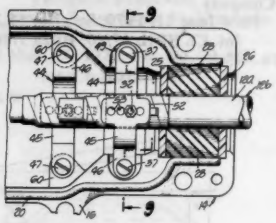
3,614,298

CABLE SPLICE CASING WITH CONDUCTIVE ANCHORAGE TO CABLE SHEATH AND SHIELD

John T. Thompson, 244 Loring St., Los Angeles;, Calif., and George W. Gillemot, 2331 20th St., Santa Monica, Calif.

Filed Feb. 19, 1970, Ser. No. 12,819
Int. Cl. H02g 15/08
U.S. Cl. 174—92 20 Claims

A cable splice casing cast in two mating halves and equipped with one or more conductive anchor assemblies for mechanically and electrically connecting the cable shield and sheath jackets to each end of the casing while the latter is open. The casing acts to interconnect the cable sheath across the splice area and to provide electrical continuity between the respective cable shield jackets. More than one cable of the same or different sizes can be readily and separately accommodated at either end of the casing. The anchorages are spaced inwardly of a sealing gasket at each end of the casing and the latter can be opened for servicing and testing



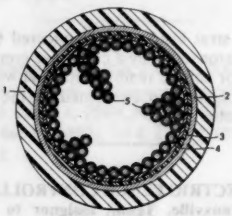
without disturbing the cable anchorage or the grounding connection between the cables and the casing.

3,614,299

LOW THERMAL CONDUCTIVITY CABLE CORE WRAP

Thomas J. Grail, Plainfield, N.J., assignor to Esso Research and Engineering Company

Continuation of application Ser. No. 677,963, Oct. 25, 1967, now abandoned. This application July 17, 1970, Ser. No. 56,245
Int. Cl. H01b 7/18, 7/34
U.S. Cl. 174—107 2 Claims



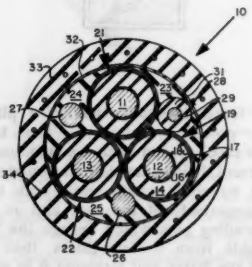
A thermally insulating laminate as a cable core wrap wherein the laminate consists of a at least one layer of a low bulk density, high-surface area material capable of intertrapping air in said laminate to lower thermal conductivity.

3,614,300

POWER CABLE WITH POLYPROPYLENE COVERED GROUND CHECK STRAND

Floyd A. Wilson, Marion, Ind., assignor to Anaconda Wire and Cable Company

Filed Oct. 22, 1970, Ser. No. 83,053
Int. Cl. H01b 9/00
U.S. Cl. 174—115 1 Claim



A three-phase shovel cable having ethylene-propylene insulation on the power conductors and bare grounding

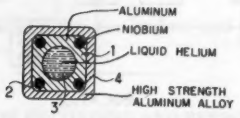
strands comprises a ground-check strand with a heavy wall of polypropylene insulation that permits the ground check to outlast the other strands in flex endurance.

3,614,301

SUPERCONDUCTING CONDUCTOR

Jean Royet, Orsay, France, assignor to Compagnie Generale D'Electricite, Paris, France

Filed Jan. 19, 1970, Ser. No. 3,663
Int. Cl. H01b 5/00, 7/34
U.S. Cl. 174—126 3 Claims



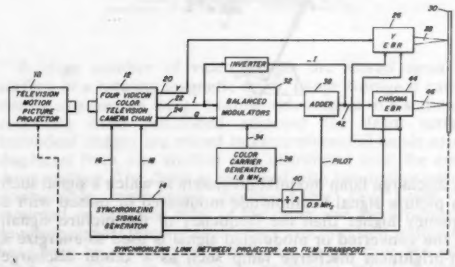
A stabilized superconducting conductor formed of a tube of aluminum alloy having at least one wire of superconductive material disposed therein and a sheath of high-strength material covering the outside of the tube in good thermal and electrical contact with the tube.

3,614,302

APPARATUS FOR RECORDING COLOR INFORMATION ON MONOCHROME FILM

Abraham A. Goldberg, Stamford, Conn., assignor to Columbia Broadcasting System, Inc.

Filed Sept. 9, 1969, Ser. No. 856,334
Int. Cl. H04n 1/46, 9/02
U.S. Cl. 178—5.2 R 6 Claims



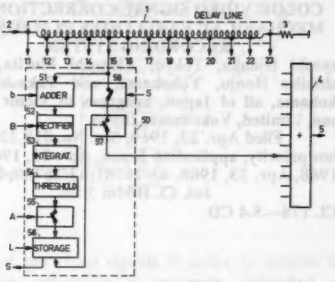
In apparatus for recording color picture information on monochrome film as two simultaneous sets of pictures, one for luminance information which may be in pictorial form, and the other for chroma information which takes the form of two color difference signals, suppressed carrier modulated in quadrature phase to each other and to which a pilot signal is added to facilitate playback, the available dynamic range of the film on which the information is recorded is better utilized by adding to the chroma signal, prior to recording, a signal corresponding to the NTSC "I" signal to make more symmetrical the chroma signal resulting from the vector addition of chroma and pilot.

3,614,303

ARRANGEMENT FOR CORRECTING TIMING ERRORS IN COLOR TELEVISION SIGNALS

Gerhard Krause, Darmstadt, Germany, assignor to Fernseh GmbH, Darmstadt, Germany

Continuation-in-part of application Ser. No. 507,997, Nov. 12, 1965, now abandoned. This application Nov. 25, 1968, Ser. No. 778,515
Int. Cl. H04n 9/02
U.S. Cl. 178—5.4 R 11 Claims



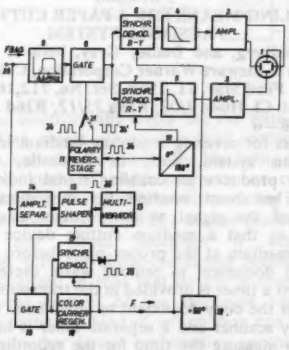
An arrangement for correcting timing errors in a color television signal which is reproduced after being stored on magnetic tape. The color television signal is applied to one end of a delay line having a plurality of taps. The other end of the delay line is terminated by a resistor having the characteristic impedance of the delay line. Each tap of the delay line is connected to a separate signal processing circuit. One such signal processing circuit is associated with each tap of the delay line. The signal from a tap of the delay line is superimposed upon a reference signal. A comparison of the tapped signal with the reference signal is made, and when the difference does not exceed a predetermined limit or threshold value, a switch is closed and the tapped signal is transmitted to an adding device which has a single output and an input for each one of the taps of the delay line. Superposition of the tapped signal with the reference signal may be accomplished either through an additive process or a multiplying process.

3,614,304

VECTOR OSCILLOSCOPE

Helmut Schonfelder, Darmstadt, Germany, assignor to Fernseh GmbH, Darmstadt, Germany

Filed Feb. 17, 1970, Ser. No. 12,892
Claims priority, application Germany, Dec. 30, 1965, F 48052
Int. Cl. H04n 9/02
U.S. Cl. 178—5.4 TE 13 Claims



A vector oscilloscope through which a PAL color television signal is displayed. The signal has two components

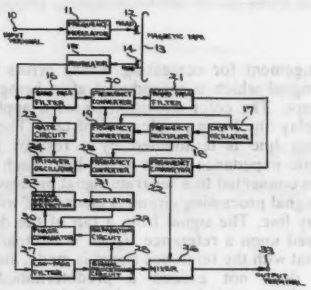
of which one is of known phase. The other of the components is of alternating negative and positive phase. The components last for one line of scan, and are applied to the deflection plates of an oscilloscope tube. The two components are suppressed during alternating line scans. Suppression is accomplished through two synchronous demodulators connected in parallel. The outputs of the demodulators are applied to the deflection plates of the oscilloscope tube, by way of amplifiers.

3,614,305

COLOR VIDEO SIGNAL CORRECTION FOR MECHANICAL VARIATIONS IN MAGNETIC RECORDING SYSTEM

Tsuneyoshi Hidaka, Tokyo; Akiyoshi Morita, Yokohama; Yoshihiko Honjo, Yokohama, and Takashi Nishimura, Yokohama, all of Japan, assignors to Victor Company of Japan, Limited, Yokohama, Japan

Filed Apr. 22, 1969, Ser. No. 818,223
Claims priority, application Japan, Apr. 23, 1968, Apr. 23, 1968, Apr. 23, 1968, 43/26781;43/26780;43/26779
Int. Cl. H04m *5/76*
U.S. Cl. 178—5.4 CD **6 Claims**



A color signal correction system for a video magnetic tape recorder removes differential frequency changes and differential phase shifts. The system comprises a trigger oscillator which oscillates in phase with a burst signal taken out of the color signal. A first means frequency modulates a color signal filtered out of the reproduced color video signal, and a second means frequency modulates the oscillation frequency of the oscillator. The output signals of the first and second frequency modulation means are mixed to produce a signal having the differential frequency removed therefrom. Control means is provided to control the natural resonant frequency of the tank circuit of the trigger oscillator, the control corresponding to the differential frequency changes and the differential phase shifts.

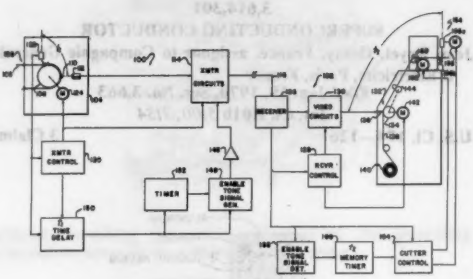
3,614,306

ENABLING MEANS FOR A PAPER CUTTER IN A FACSIMILE SYSTEM

Joel C. Goldberg, and Dudley Gray, both of Chicago, Ill., assignors to Stewart-Warner Corporation, Chicago, Ill.

Filed Mar. 11, 1968, Ser. No. 712,165
Int. Cl. H04n *1/02;* **F16h** *35/12;* **B26d** *5/26*
U.S. Cl. 178—6 **23 Claims**

Apparatus for severing recording medium in a document reproduction system, such as facsimile, wherein the transmitter produces an enabling signal indicating that a document has been inserted for reproduction and the detection of the signal at the receiver enables a timer apparatus so that a medium cutting device will cut the recording medium at the proper place before and after the reproduced document to remove waste therefrom. In one embodiment a timer is provided in the transmitter to measure the time for the copy document to move from the copy inlet to the copy scanner and a separate timer is included in the receiver to measure the time for the recording medium to travel from the marking means to the paper cutter. In a second embodiment a timer is provided in the receiver which by itself measures the time required for the copy document at the transmitter to travel from the inlet to the scanner and



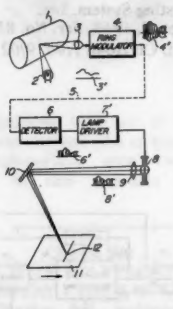
the time required for the recording medium to go from the marking means to the cutter.

3,614,307

DISCHARGE LAMP MODULATION SYSTEM

Kaoru Sasabe, Ikeda-shi, and Hiroaki Kotera, Moriguchi-shi, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 11, 1968, Ser. No. 766,784
Claims priority, application Japan, Oct. 16, 1967, 42/67093
Int. Cl. H04n *1/22, 1/40*
U.S. Cl. 178—6 **9 Claims**



A discharge lamp modulation system in which a signal such as a picture signal is amplitude-modulated or pulsed with a frequency higher than the frequency of the picture signal, and the converted or modulated signal is used to energize a high-brightness discharge lamp such as a xenon discharge lamp for obtaining an optical reproduced signal which is an exact reproduction of the original signal.

3,614,308

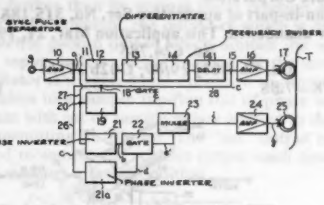
MAGNETIC RECORDING AND REPRODUCING SYSTEM WITH ALTERNATING POLARITY INVERSION

Katsuyuki Iwai; Motonori Fukatsu, and Fujio Sato, all of Tokyo, Japan, assignors to Akai Electric Company Limited, Tokyo, Japan

Filed Sept. 8, 1966, Ser. No. 577,924
Claims priority, application Japan, Dec. 20, 1965, 40/78191
Int. Cl. G11b *5/02;* **H04n** *5/78, 7/12*
U.S. Cl. 178—6.6 A **2 Claims**

Apparatus for direct-recording and direct-reproducing television video signals in longitudinal tracks on magnetic tape by reversing the polarity of the video signals at intervals

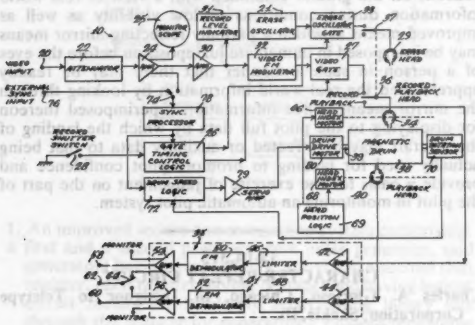
at least as long as the horizontal period of the video signal. Gating pulses are generated responsive to the blanking signals for alternately gating the inverted and noninverted video signals.



3,614,309
APPARATUS FOR RECORDING AND REPRODUCING SINGLE FRAME VIDEO IMAGES ON A PLURAL TRACK RECORD

Biagio S. Presti, Bloomington, Ind., assignor to Sarkes Tarzian, Inc., Bloomington, Ind.

Filed Dec. 26, 1968, Ser. No. 787,115
Int. Cl. G11b *21/08*; H04n *5/78*
U.S. Cl. 178—6.6 DD **7 Claims**



A large number of video images are stored upon the surface of a rotating magnetic drum. Image storage is carried out by applying an image bearing video signal to a stationary recording head positioned adjacent the drum surface. Individual images are stored in circumferential bands axially displaced from one another and distributed over the entire drum surface. The drum is equipped with two independently positionable reproducing heads. These two heads are mounted on opposite sides of the drum and are arranged to generate signals that are electrically synchronized so that one head may be moved to select a new image while the other head is utilized to display a previously selected image, thereby providing for rapid selection of different images in the manner of a conventional slide projector for still slides.

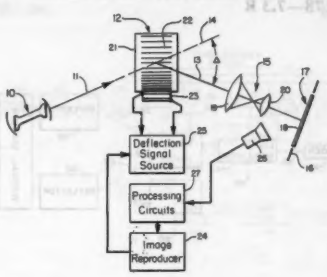
3,614,310
ELECTROOPTICAL APPARATUS EMPLOYING A HOLLOW BEAM FOR TRANSLATING AN IMAGE OF AN OBJECT

Adrians Korpel, Prospect Heights, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Mar. 2, 1970, Ser. No. 15,540
Int. Cl. H04n *5/14, 7/18*
U.S. Cl. 178—6.8 **12 Claims**

A hollow beam of monochromatic light is deflected repetitively through a scanning pattern and focused upon an image plane in which is located an object desired to be scanned. A detector senses light reflected from or transmitted through the object to develop video signals that at each instant of time represent light intensity. These video signals are fed to an image reproducer that creates an image of the object in synchronization with the scanning pattern. The apparatus further includes a filter system that effects a modification of the video signals in order to restore image contrast which otherwise is seriously degraded as a consequence of utilizing a hollow light beam in order to obtain an increase in depth of field for the optical system.

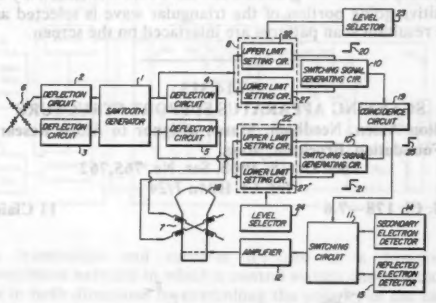
The disclosure also concerns using the apparatus for video recording as well as reproducing.



3,614,311
APPARATUS FOR SIMULTANEOUSLY DISPLAYING A PLURALITY OF IMAGES OF AN OBJECT BEING ANALYZED IN AN ELECTRON BEAM DEVICE

Tatsuo Fujiyasu, and Kouichi Hara, both of Katsuta-shi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 25, 1969, Ser. No. 802,006
Claims priority, application Japan, Feb. 28, 1968, 43/1226
Int. Cl. H04n *5/22, 5/14*
U.S. Cl. 178—6.8 **2 Claims**

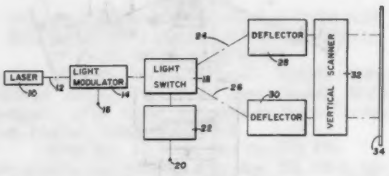


A device for electronically displaying the state of surface or the like of an object placed in a field scanned with an electron beam, said surface state or the like being detected as any of several kinds of electromagnetic or corpuscular information and said detected information being introduced as a brightness-modulated signal to a display means such as a cathode-ray tube whose faceplate is scanned in synchronization with the above-mentioned scanning of the sample; characterized in that said device is constituted so that an optional portion of the displayed basic image representing a particular kind of information can be readily replaced with another image representing another kind of information pertaining to said surface state or the like of the sample.

3,614,312
LIGHT BEAM DEFLECTION

Gerald R. Fournier, and Charles E. Baker, both of Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 31, 1968, Ser. No. 788,259
Int. Cl. H04n 3/02
U.S. Cl. 178—7.3 R 11 Claims

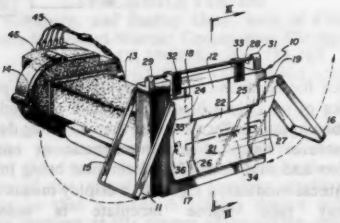


A light beam is deflected into a pattern represented by a synthesized sawtooth waveform by means of a light switch and a triangular wave generator. In a video display application, a light switch directs an intensity modulated light beam along one of two paths. When directed along either path, the modulated light beam is incident upon one or the other of a mirror pair. One mirror of the pair reflects a light beam incident thereon from along a first path to the second mirror for reflection therefrom in a pattern approximated by a triangular wave, and the second mirror of the pair reflects a light beam incident thereon from along the second path to the first mirror for reflection therefrom in a pattern approximated by a triangular wave displaced 180° from the first pattern. To generate the approximated triangular waves, the first mirror of the pair oscillates at a frequency ω to deflect a light beam incident thereon in a pattern represented by the expression (sin ωt) and the second pair oscillates at a frequency 3 ω to deflect a light beam incident thereon in a pattern represented by the expression (sin 3 ωt), where ω equals the fundamental frequency. The mirrors oscillate in a manner such that the individual patterns produced are optically added. To generate the sawtooth function, only the positive going portion of the triangular wave is selected and the resultant scan patterns are interlaced on the screen.

3,614,313
SCANNING APPARATUS SUPPORT STRUCTURE

Milton Alden, Needham, Mass., assignor to Alden Research Foundation, Brockton, Mass.

Filed Oct. 8, 1968, Ser. No. 765,762
Int. Cl. H04n 1/24
U.S. Cl. 178—7.6 11 Claims

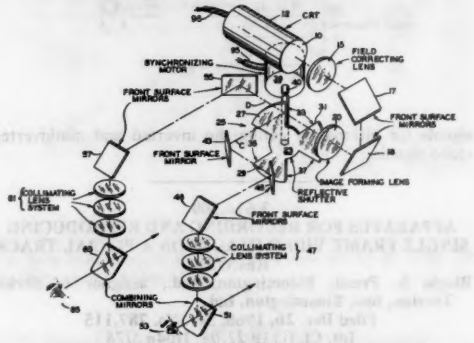


This invention relates to scanning apparatus and, more particularly, to apparatus for converting a visual image into an electrical communications signal for reconversion at a remote station.

3,614,314
OPTICAL DISPLAY MEANS FOR AN ALL-WEATHER LANDING SYSTEM OF AN AIRCRAFT

Francis Henry Sand Rossire, Salisbury, Conn., assignor to The Bendix Corporation

Continuation-in-part of application Ser. No. 315,188, Oct. 10, 1963, now abandoned. This application Mar. 21, 1967, Ser. No. 624,785
Int. Cl. H01j 29/89; G02b 27/14
U.S. Cl. 178—7.88 18 Claims

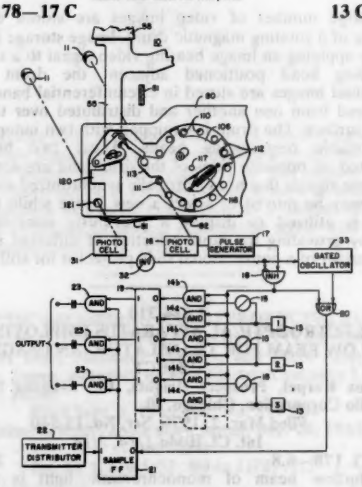


An optical means to display immediately before both eyes of a pilot of an aircraft in pictorial fashion an image of substantial spacial identity to that of a physical array of beacons on the ground combined with a view of real world information during conditions of low visibility as well as improved means in which a partially reflecting mirror means may be interposed in immediate juxtaposition before the eyes of a person in such a manner that there may be readily apprehended the real world information by looking through the mirror means, while information superimposed thereon for displaying to the pilot full data by which the landing of the aircraft may be effected or auxiliary data to that being actually used for landing to promote pilot confidence and provide a basis for the exercise of judgement on the part of the pilot in monitoring an automatic pilot system.

3,614,315
CHARACTER REPEAT CIRCUIT

Charles A. Glorioso, Chicago, Ill., assignor to Teletype Corporation, Skokie, Ill.

Filed Aug. 26, 1968, Ser. No. 756,735
Int. Cl. H04l 15/16
U.S. Cl. 178—17 C 13 Claims



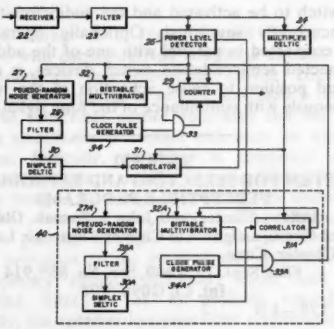
A photoelectric keyboard employing a shutter which is cocked and released upon depression of a key has the

information obtained from the shutter supplied to a storage register where it is held until a demand for it is made by a transmitting distributor. In order to repeat the information encoded by the depression of a particular key, the key is depressed farther than its normal lower position and blocks an auxiliary light channel, the output of which is detected by a photoelectric pickup device which inhibits the application of further inputs to the storage register. At the same time, a gated oscillator is triggered into operation to provide a series of reset pulses to a sample flip-flop out of phase with but in synchronism with set or sample pulses applied to the flip-flop from a transmitting distributor. The "set" output of the flip-flop is used to sample the register output each time that the flip-flop is set from a reset condition.

3,614,316
SECURE COMMUNICATION SYSTEM

Daniel E. Andrews, Jr.; William E. Klund, and Robert D. Isaak, all of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy

Continuation-in-part of application Ser. No. 352,687, Mar. 17, 1964. This application May 20, 1964, Ser. No. 369,035
Int. Cl. H04l *9/00*; H04k *1/10*
U.S. Cl. 178—22 **4 Claims**

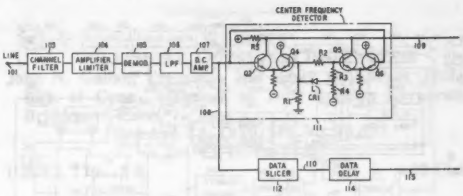


1. An improved secure communication system comprising:
a first and a second pseudorandom noise generator, said generators having, respectively, a first and a second shift register, each register having N stages and having logical circuit means for randomly recirculating binary bits through the register for generating a random repeatable pattern of binary bits,
a reset pulse source coupled to all stages of said first register to reset said first register to a predetermined starting binary number,
a starting point switch matrix comprising N logical zero-one switches connected, respectively, between the stages of said second register and said reset pulse source,
means for feeding a binary information number to said switches to reset said second register to a starting point a predetermined number different from the starting binary number of said first register,
transmitting means for transmitting said pseudorandom noise generators outputs connected to the outputs of said pseudorandom noise generators;
receiving means for receiving said transmitting means transmissions, said receiving means having an output;
recycling storage means connected to the output of said receiving means for storing the receiving means output signals;
a third pseudorandom noise generator identical in sequence to said first and second pseudorandom noise generators having an output and a reset input, said receiving means output connected to said reset input;
a correlator having a first input connected to said storage means and a second input connected to said third pseudorandom noise generator output for generating a signal upon correlation of said storage means output and said third pseudorandom noise generator output, and;
timing means connected to said correlator for timing the interval between outputs thereof.

3,614,317
THREE-STATE FREQUENCY SHIFT SIGNAL RECEIVER

Paul Benowitz, Freehold, and Heinz Kahlbrock, Edison, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 26, 1969, Ser. No. 836,732
Int. Cl. H04l *27/00*; H04b *1/16*
U.S. Cl. 178—66 **13 Claims**

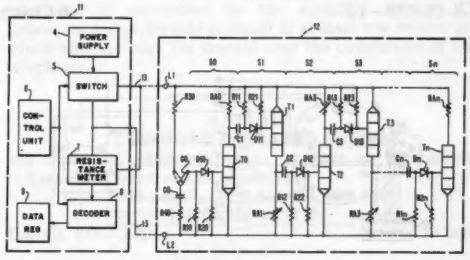


A center frequency region in the signal channel band is assigned to supervisory (on-hook) signals and an upper and a lower frequency region is assigned to (mark and space) data signals whereby a greater frequency swing for increased power and bandwidth is obtained for the data signals. When incoming signals are in the center frequency region, the data signal output is blocked. Normal data signals, however, sweep through the center frequency region when a signal transition occurs. The data signal is delayed so that the delayed signal transition appears in the output after the blockage terminates.

3,614,318
DATA TRANSMISSION SYSTEM

Ulrich Klose, Lidingo, Sweden, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 6, 1969, Ser. No. 847,858
Claims priority, application Sweden, Sept. 3, 1968, 11812
Int. Cl. H04l *27/02*
U.S. Cl. 178—68 **7 Claims**



A transmitter and receiver for use in a two-wire transmission network in which a central station controls data flow in both directions by controlling the polarity of the line and the transmitter and receiver each include a plurality of polarity sensitive switching stages in which adjacent stages have opposite polarity orientation and each of the stages is turned "on" by one polarity orientation and "off" by the opposite polarity orientation on the transmission line.

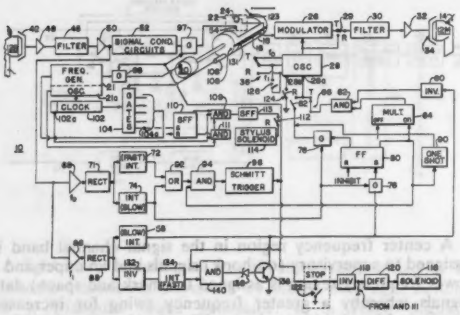
3,614,319
TELEPHONIC TRANSMISSION OF DATA IN GRAPHIC FORM

Robert E. Krallinger; Edward G. Keplinger, and Jerry W. Terrell, all of New Milford, Conn., assignors to Graphic Sciences, Inc., Danbury, Conn.

Filed Feb. 24, 1969, Ser. No. 801,708
Int. Cl. H04n *1/36*
U.S. Cl. 178—69.5 F **17 Claims**

A facsimile transmission system includes an automatic signalling arrangement in which the station at one end of the

line transmits an initiating signal and the other station responds with a reply signal. After a predetermined interval following the end of the reply signal, the transmitter sends a start signal which begins document scanning at the transmitting station and facsimile printing at the receiving station. The start signal is used by both stations as a reference for synchronizing their respective operations.



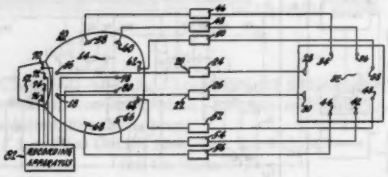
During transmission of the document, the operator at the receiving station can interrupt the process by resuming transmission of the reply signal, the transmitter responding to this signal, by turning off. Similarly, the receiver responds to an interruption in the received signal by turning off, thereby providing the operators at both ends of the line with a means for rapidly signaling each other if the transmission is to end prematurely.

3,614,320

STEREOPHONIC SOUND ENHANCEMENT SYSTEM WITH REVERBERATION CHAMBER

John E. Volkmann, Princeton, N.J., assignor to RCA Corporation

Filed Dec. 13, 1968, Ser. No. 783,618
Int. Cl. H04r *5/02*
U.S. Cl. 179—1 J **6 Claims**



The reverberation characteristics of an auditorium or music hall are improved by picking up the sound originating in the auditorium with microphones, and reproducing the sound in a second room having a more optimal reverberation characteristic. A second set of microphones in the second room picks up the sound and its reverberations for transmission to a group of loudspeakers in the auditorium, where it is blended with the original sound.

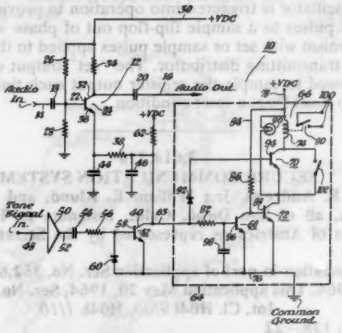
3,614,321

REMOTE FUNCTIONAL CONTROL CIRCUIT

Henry W. Shaw, and Milton N. Lanford, both of Morrilton, Ark., assignors to Sound-Craft Systems, Inc., Morrilton, Ark.

Filed Mar. 7, 1969, Ser. No. 805,255
Int. Cl. H04m *1/28;* **G03b** *31/00*
U.S. Cl. 179—1 SW **8 Claims**

We disclose a receiver of the type having an audiocircuit portion, a functional control circuit comprising a relay switch, a tone signal circuit having semiconductor switching means sensitive to presence of a certain tone signal, and additional series-connected semiconductor switch devices connected to the audiocircuit portion and to the first mentioned switching means, the presence of the certain tone signal causing the relay switch to be deactivated while enabling the audio circuit portion to function normally, but momentary interruption of the certain tone signal causing the relay switch to be activated and the audiocircuit portion to be concurrently squelched. Optionally operable switch means, connected in parallel with one of the additional series-connected semiconductor switch devices, is effective in its closed position to cause activation of the relay switch coterminously with continuance of the tone signal.

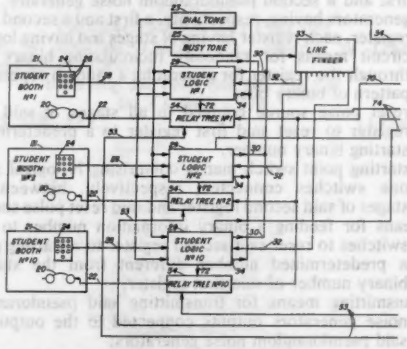


3,614,322

SYSTEM FOR SELECTING AND REPRODUCING PERCEPTIBLE PROGRAMS

David L. Joslow, Chester, and John J. Bosnak, Old Saybrook, both of Conn., assignors to Chester Electronic Laboratories, Inc., Chester, Conn.

Filed Sept. 22, 1969, Ser. No. 859,914
Int. Cl. G09b *5/04*
U.S. Cl. 179—1 B **25 Claims**



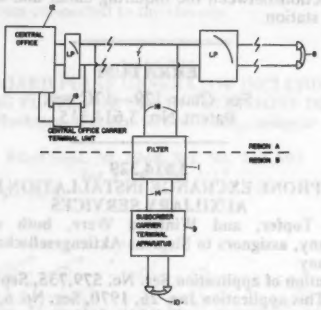
A system for selecting and reproducing audio, video, or other humanly perceptible programs comprises a program source providing a multiplicity of program signals, a plurality of stations at which individual programs may be reproduced, a switching mechanism for selectively connecting selected program signals to the reproducing means at each station, and manually operable means at each station for controlling the switching mechanism. The switching mechanism includes one or more crossbar switches and a plurality of relay trees so as to provide a hard-wired connection between the reproducing means and the program source for each selected program signal. The manually operable means for controlling the switching mechanism consists of a touch tone pad at each station, and the design of the system is such as to utilize solid-state components to a high degree.

3,614,323

FILTER TO SECURE PRIVACY OF CARRIER-DERIVED TELEPHONE CIRCUITS

Walter L. Roberts, and Henry Lynn Newton, both of Hickory, N.C., assignors to Superior Continental Corporation, Hickory, N.C.

Filed May 20, 1969, Ser. No. 826,152
Int. Cl. H04m 1/70
U.S. Cl. 179—1.5 6 Claims



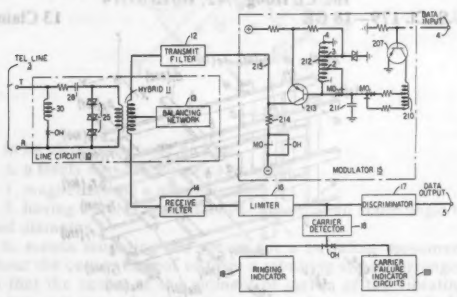
Disclosed herein is a filter adapted to be used in conjunction with carrier-derived telephone circuits, so as to insure privacy of that subscriber carrier circuit from intentional eavesdropping. In service, this filter is interposed between the subscriber carrier apparatus and the physical pair, being electrically in contact with each via appropriate connections. Basically, the filter is composed of three fundamental elements, a rectifier-low-pass filter combination electrically bridged by a high-pass filter. This three-element combination does not noticeably affect either carrier frequencies passing through the filter or normal voice frequency operation on the physical pair, but does weaken voice frequency signals sufficiently upon such passing through the filter so as to prohibit eavesdropping. Additionally, the rectifier-low-pass filter combination allows passage of voltage through the filter to permit use of the filter with carrier systems, which depend upon the voltage on the physical pair to power the subscriber unit or to maintain a charge on a battery located in the subscriber carrier apparatus.

3,614,324

ARRANGEMENT FOR USING A DATA SET CARRIER DETECTOR TO DETECT INCOMING RINGING

Clair Alan Buzzard, Eatontown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Mar. 6, 1970, Ser. No. 17,235
Int. Cl. H04m 11/06
U.S. Cl. 179—2 DP 7 Claims



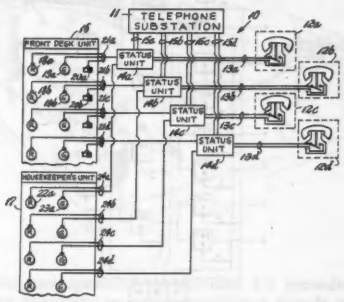
A terminating or answer-only data set terminates a telephone line by way of a hybrid transformer whose winding on the data set side is connected between the data set transmitter and receiver to apply transmitted signals to the line and to apply incoming line signals to the receiver. While the data set is on-hook, the transmitter sends a steady tone. Threshold devices (reversely poled diodes) are connected across the line and conduct in response to ringing signals on the line, placing a low-impedance shunt across the line side winding of the hybrid transformer. This low impedance is reflected across to the data set side winding which thereby passes the transmitted tone to the receiver to indicate the detection of incoming ringing signals.

3,614,325

TELEPHONE AND SIGNALING SYSTEM

John N. Galian, Trumbull, and Bruce C. Kurylo, Milford, both of Conn., assignors to Totel Systems Corporation, Bridgeport, Conn.

Filed Apr. 15, 1970, Ser. No. 28,597
Int. Cl. H04m 11/02
U.S. Cl. 179—2 R 10 Claims



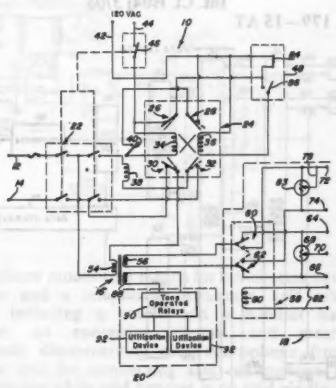
A system for selectively providing connection of a telephone at a location to either a telephone substation for communication or to a signaling system with the system having an indicator and the telephone being used to alter the condition of the indicator. The system is preferably used where there are many locations, hence many telephones and with an indicator for each telephone with each telephone being capable of only controlling its indicator when the telephone is connected to the signaling system. The indicators are preferably grouped at at least one master area which also includes the control over the connection of each telephone.

3,614,326

TELEPHONE ACTUATED SWITCH

Joe Cameron, Millbrook, Ala., assignor to International Automated Electronics Corporation

Filed July 7, 1969, Ser. No. 839,480
Int. Cl. H04m 11/00
U.S. Cl. 179—2 A 5 Claims



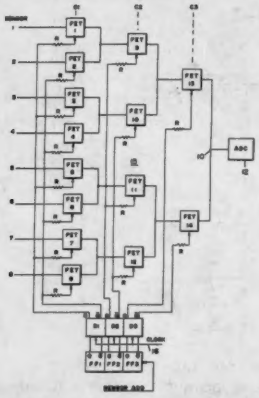
An electronic switch serving as a communications link between a remotely situated telephone caller and a

headquarters. The communications link is adapted to connect a two-way radio to the telephone lines at a subscriber station, which receives a message from the caller, and relays it to headquarters. Likewise, a message from headquarters is relayed through the communications link to the caller.

3,614,327
DATA MULTIPLEXER USING TREE SWITCHING CONFIGURATION

George M. Low, Deputy Administrator of the National Aeronautics and Space Administration with respect to an invention of; Richard A. Easton, Sherman Oaks, Calif., and Edward E. Hilbert, Pasadena, Calif.

Filed Oct. 5, 1970, Ser. No. 78,065
Int. Cl. H04j *3/04*
U.S. Cl. 179—15 A **8 Claims**

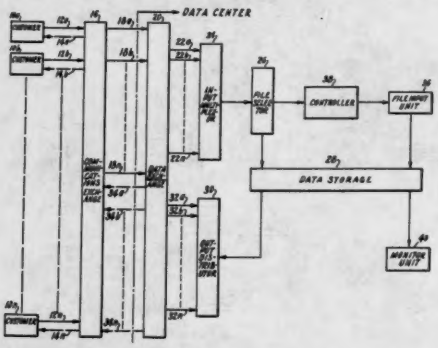


A data multiplexer is disclosed in which FETs are arranged in a tree switching configuration of *n* columns and are driven by *n* drivers to control the multiplexing of data from 2^n sources. Each column of FETs is controlled by a different driver which has two outputs. Only when the driver is clocked are certain of the FETs connected thereto enabled, depending on the input level at one of the driver's two input terminals during the clock pulse period. In the absence of a clock pulse all FETs are in their OFF state. Serial-parallel redundancy of the FETs and in the drivers are employed to increase reliability.

3,614,328
AUTOMATIC SUBSCRIBER ANSWERING SERVICE

Kenneth Eugene McNaughton; Richard Lee McNaughton, both of 4216 Corcoran St., Alexandria, Va., and Arthur E. Morrissette, 8200 E. Blvd. Drive, Alexandria, Va.

Filed June 24, 1969, Ser. No. 836,052
Int. Cl. H04j *3/08*
U.S. Cl. 179—15 AT **11 Claims**



The disclosed invention is an apparatus for storing data and automatically disseminating such data in response to an inquiry and effecting a communication connection from the inquiring station to a desired called station accordance with a further instruction form the inquirer. The apparatus generally includes a data storage unit in which information concerning various subscribers is stored. A file selector responsive to an inquiry and the location of the inquiry searches the storage unit and selects the most appropriate information which is then transmitted by an output distributor to the inquirer. The information supplied by the data storage unit in response to the inquiry is also operative to effect a communication link or connection between the inquiring caller and a subscriber or called station.

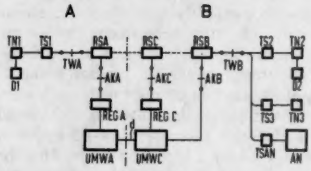
ERRATUM

For Class 179—17C see:
Patent No. 3,614,315

3,614,329
TELEPHONE EXCHANGE INSTALLATION HAVING AUXILIARY SERVICES

Herbert Topfer, and Winfried Werr, both of Munich, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Continuation of application Ser. No. 579,735, Sept. 15, 1966. This application Jan. 26, 1970, Ser. No. 6,046
Int. Cl. H04m *3/42*
U.S. Cl. 179—18 BE **7 Claims**

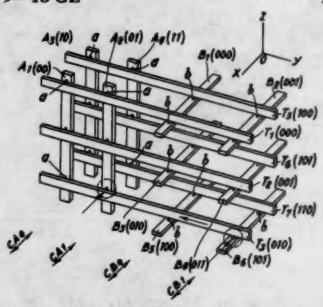


In long distance communication installations in which dial signals are emitted by ;the subscriber stations for establishment of connections, and thereafter information signals are emitted for use in connection with auxiliary functions, central exchange systems are provided with means for transforming the information contents of the information signals to conform with differences in auxiliary function capabilities from exchange to exchange, and from station to station.

3,614,330
SWITCHING DEVICE FOR PERFORMING SWITCHING OPERATIONS BETWEEN INPUT AND OUTPUT LINES

Roger Marcel Chaveneaud, Levallois-Perret, and Georges Janoska, Courbevoie, both of France, assignors to Societe A Responsabilite Limitee: Societe Lampy D'Etudes et de Recherches "S.O.L.E.R.", Courbevoie, France

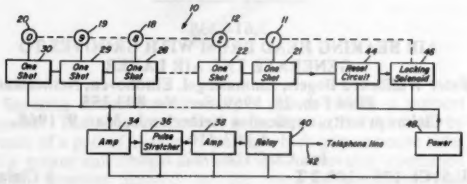
Filed Feb. 19, 1968, Ser. No. 706,544
Claims priority, application France, Feb. 23, 1967, 96,300
Int. Cl. H04g *3/42*; **H01h** *67/14*
U.S. Cl. 179—18 GE **13 Claims**



A switching device for performing switching operations between a first group of incoming lines and a second group

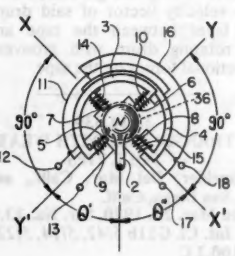
of outgoing lines in response to an input signal representing in a selected code the identification of an incoming and outgoing line is provided. The switching device includes a plurality of bistable input frames and a plurality of bistable output frames which are actuated in response to a coded input signal. The device also includes a plurality of bistable junction rods mounted for transverse movement relative to the bistable input and output frames which are also actuated in response to the input signal. The bistable input and output frames and the junction rods operate circuits associated with the bistable frames for selectively connecting incoming and outgoing lines connected to the circuits.

3,614,331
KEYBOARD PULSE GENERATOR INCLUDING A LOCKING PLATE FOR USE IN TELEPHONE DIALING
Evert M. Hoekstra, Garden Grove, Calif., assignor to MKH, Inc.
Filed Sept. 30, 1968, Ser. No. 763,593
Int. Cl. H04m *1/32*
U.S. Cl. 179—90 K **2 Claims**



A pushbutton keyboard dialing system including generator means for producing a pulse train indicative of a particular actuated pushbutton. A mechanical interlock is provided for inhibiting successive pushbutton depression until the entire pulse train of an actuated pushbutton has cleared the system.

3,614,332
ELECTROMAGNETIC STEREOPHONIC PHOTOGRAPH PICKUP
Motohiro Nagasaki, 101 Tokiwomatsu-cho, Shibuya-ku, Tokyo, Japan
Filed Sept. 29, 1959, Ser. No. 843,106
Claims priority, application Japan, Oct. 3, 1958, 33/28195
Int. Cl. H04r *11/12*
U.S. Cl. 179—100.41K **10 Claims**



in an electromagnetic pickup,

a. a freely movable spherical magnet,

1. magnetized on a diameter and

2. having a stylus arm attached thereto at an acute angle to said diameter,

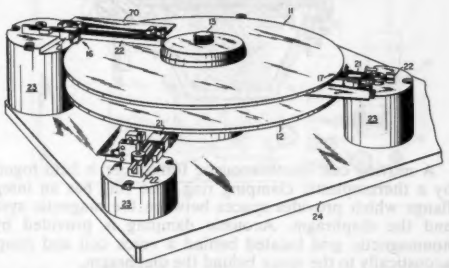
b. means mounting the sphere for a swiveling movement about the center thereof to form a vibrating system arranged so that the center of the moment of inertia of the vibrating system corresponds with the center of movement of the stylus and,

c. a plurality of stator elements each having a pair of pole pieces facing said spherical magnet and on opposite sides of a plane normal to the poles of said spherical magnet,

1. the respective poles of one stator being in a vertical plane substantially 90° around the spherical magnet poles from the corresponding poles of a second stator element, and

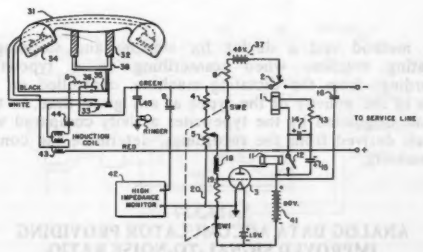
2. the stator elements being symmetrically arranged around the spherical magnet so that the magnetic airgap between said stator elements and said spherical magnet remains substantially constant.

3,614,333
HEAD MOUNT FOR A MAGNETIC DISC RECORDER
Akiyoshi Iwata, Belmont, Calif., assignor to Ampex Corporation, Redwood City, Calif.
Filed Mar. 18, 1968, Ser. No. 713,900
Int. Cl. G11b *3/36, 5/60, 5/82*
U.S. Cl. 179—100.2CA **7 Claims**



A method and apparatus is provided for recording and reproducing television or other broadband signals with an altered time base effect so as to provide, for example, in the case of television signals, slow motion, faster than normal motion, stop motion or reverse motion. To provide slow motion replay of television signals, successive fields of the signal are recorded separately on a plurality of magnetic mediums, and at predetermined head-to-medium writing speeds, and are played back at substantially the same head-to-medium writing speeds. On playback, each field is repeated a number of times depending upon the time base effect desired. Reverse motion is provided by reversing the order of replay of the fields.

3,614,334
TELEPHONE MONITOR
Duane J. Bonvallet, Milford, Mich.
Filed Nov. 12, 1957, Ser. No. 696,588
Int. Cl. H04m *1/24*
U.S. Cl. 179—107 **10 Claims**



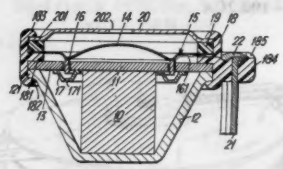
In a telephone monitoring means for connection between a service line and a telephone instrument, said telephone instrument including a cradle and a handset having a microphone: an energizing means, and means for simultaneously disconnecting said microphone from said service line and for connecting said microphone to said energizing means while said handset is on said cradle, so that crosstalk and line noise present in said service line are not transmitted to said microphone during monitoring.

3,614,335

ELECTROACOUSTIC TRANSDUCER HELD TOGETHER BY THERMOPLASTIC CLAMPING RING

Leslie Eugene Basil Dymoke-Bradshaw, Edgware, and Norman William Tester, London, both of England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed July 30, 1969, Ser. No. 846,034
Claims priority, application Great Britain, Aug. 8, 1968, 37939/68
Int. Cl. H04r 9/02
U.S. Cl. 179—115.5 R 7 Claims



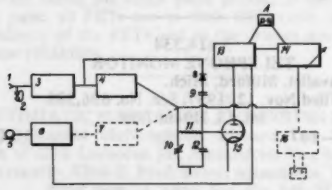
A moving coil electroacoustic transducer is held together by a thermoplastic clamping ring. The ring has an integral flange which provides spaces between the magnetic system and the diaphragm. Acoustic damping is provided by a nonmagnetic grid located behind a voice coil and coupled acoustically to the space behind the diaphragm.

3,614,336

METHOD AND DEVICE FOR STARTING AND STOPPING A DICTATING MACHINE

Walter George Wilfrid Patey, Utsiksveien, Nesoddtangen, near Oslo, Norway

Filed Dec. 17, 1968, Ser. No. 784,425
Claims priority, application Norway, Dec. 23, 1967, 168,986
Int. Cl. G11b 15/18
U.S. Cl. 179—100.IVC 5 Claims



A method and a device for starting and stopping a dictating machine when transcribing on a typewriter recordings from the dictating machine, controlled on the basis of the activity of the typist at any given time, in that signals originated by the typewriter activity compared with signals derived from the recordings, determine the control parameters.

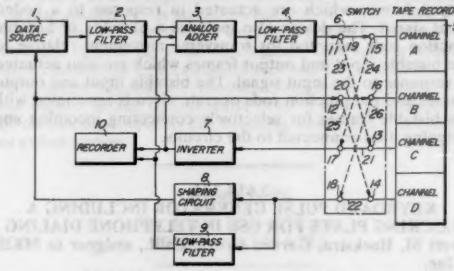
3,614,337

ANALOG DATA ACCUMULATOR PROVIDING IMPROVED SIGNAL-TO-NOISE RATIO

Shigeo Minami, Ashiya-shi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Sept. 27, 1968, Ser. No. 763,334
Claims priority, application Japan, Sept. 29, 1967, 42/62950
Int. Cl. G11b 5/02, 5/86
U.S. Cl. 179—100.2 K 9 Claims

An analog data accumulator which stores the first analog data from an analog data source in a tape recorder through an analog adder, reproduces the stored analog data to feed it to the adder reproduces the stored analog data to feed it to the adder which adds the reproduced first analog data and the second analog data from the analog data source, and



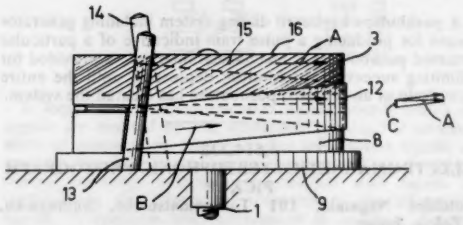
stores the added data in the tape, recorder, and repeats these operations a plurality of times, thereby improving the signal to noise ratio.

3,614,338

AIR BEARING HEAD DRUM WITH GROOVES TO GENERATE THE AIR LAYER

Peter Willibrord Bogels, Emmasingel, Eindhoven, Netherlands

Filed Feb. 28, 1969, Ser. No. 803,255
Claims priority, application Netherlands, Mar. 9, 1968, 6,803,410
Int. Cl. G11b 5/52, 15/64
U.S. Cl. 179—100.2 T 6 Claims



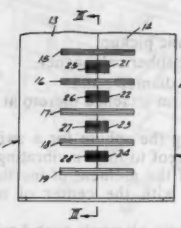
A tape recording and/or playback apparatus having a pair of drums acting as a guide member, arranged concentrically, one above the other, for helically guiding the tape therearound. One of the drums is rotatably mounted and is provided with circumferential grooves, which intersect the circumferential velocity vector of said drum. The grooves create an air layer between the tape and drum guide member. The rotating drum with grooves thereon, thus reduces the functional forces on the tape.

3,614,339

MAGNETIC TRANSDUCER WITH WEAR RESISTANT POLE TIPS

Robert A. Schneider, Del Mar, Calif., assignor to Spin Physics, Inc., San Diego, Calif.

Filed Mar. 27, 1970, Ser. No. 23,157
Int. Cl. G11b 5/42, 5/14, 5/22
U.S. Cl. 179—100.2 C 5 Claims



A composite magnetic transducer head for operation at frequencies in the megahertz range having pole tips made of

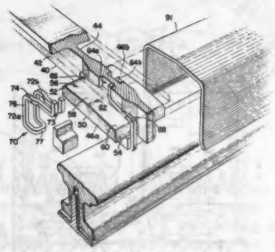
specially fabricated laminations formed from ingots of fusion cast or sintered iron-silicon-aluminum alloy.

3,614,340

SECURING MEANS FOR POWER RAIL AND/OR SHIELD

Johan L. Harmsen, 68 Hawkridge, Markham, Ontario, Canada

Filed Oct. 17, 1969, Ser. No. 867,139
Int. Cl. B60m 1/30
U.S. Cl. 191—32 8 Claims



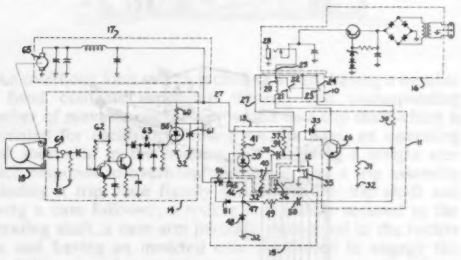
Securing means for attaching a power rail to a support member. The support member is secured to the third rail by means of a pair of U-shaped clamps which grip opposite sides of a power rail flange and each are removably contained within grooves formed in the support member. Two protrusions disposed on opposite sides of the support member serve as guiding surfaces to attachment of the clamps to the support member and also, in one embodiment of the invention, support a power rail shield.

3,614,341

CIRCUITRY FOR PROVIDING ONE ADDITIONAL COMPLETE PLAYBACK OF A RECORDED MESSAGE FOR EACH INPUT SIGNAL

Lee E. Cannon, Bozeman, Mont., assignor to Darrell S. Smith, Cut Bank, Mont.

Filed Aug. 6, 1969, Ser. No. 848,027
Int. Cl. G11b 15/18; H03k 17/56; H01h 47/32
U.S. Cl. 179—100.2 S 8 Claims



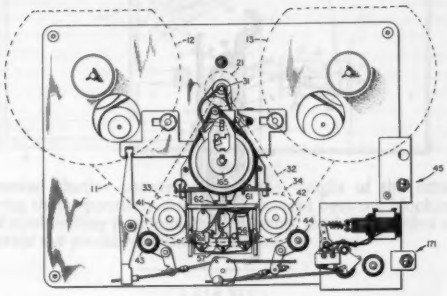
A tape playback head in conjunction with a continuous prerecorded magnetic tape for providing an output signal each time the tape makes a complete revolution, said signal being utilized to stop conduction in an SCR upon the first occurrence thereof and the second occurrence being allowed to pass through the SCR circuit to the base of a transistor to cut off the transistor and open a relay circuit to remove power from the tape-driving mechanism. Turning on the tape-driving apparatus, triggers the SCR to produce conduction therein and prevent passage of signals through the circuit thereof until conduction in the SCR is again stopped by the first signal. Thus, the continuous tape is allowed to make two complete revolutions and actuating the energizing switch during the second revolution resets the circuitry so that an additional revolution will be made.

3,614,342

BIDIRECTIONAL TAPE TRANSPORT WITH REVERSIBLE HEAD MECHANISM DRIVEN BY LAPSTAN MOTOR

Raymond C. Siebert, Saratoga, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed June 2, 1969, Ser. No. 829,565
Int. Cl. G11b 21/08
U.S. Cl. 179—100.2CA 10 Claims



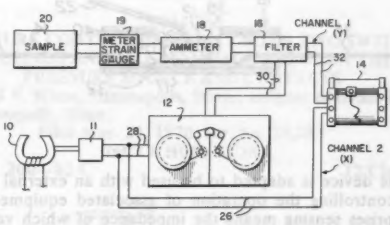
In a bidirectional tape transport it is arranged that an erase head and a set of recording and playback heads are reversible as an assembly, as by rotation for 180° about an axis normal to the plane of the tape, so that, in each direction of tape motion (forward or reverse) the erase head is upstream from the recording head and all of the heads trace a different set of longitudinal tracks on the tape, i.e., one set of tracks in forward motion and another set in reverse motion. The tape is driven by a pair of capstans coupled to a reversible electric motor, and the motor is reversed to change the direction of the tape motion.

3,614,343

RECORDER USING SELECTIVE NOISE FILTER

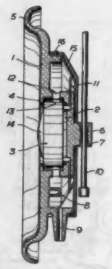
John E. Mulhern, Jr., and Dwight M. Harris, both of Durham, N.H., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Feb. 5, 1969, Ser. No. 796,690
Int. Cl. G11b 27/32, 27/36
U.S. Cl. 179—100.2 K 8 Claims



A recording method and system is disclosed which provides for selective reprocessing and filtering of the data to obtain the optimum signal-to-noise ratio without a corresponding loss of the data range or fidelity. More particularly, an improved method and system is disclosed for producing a multidimensional recording of a multivariable data signal with a minimum amount of low-frequency noise and interference in the signal.

3,614,344
EARPHONE ASSEMBLY WITH RESILIENTLY RETAINED TRANSDUCER
Rudolf Gorike, Wien, Austria, assignor to Akustische u. Kino-Gerate Gesellschaft m.b.H., Wien, Austria
Continuation of application Ser. No. 638,001, May 12, 1967. This application June 16, 1970, Ser. No. 48,910
Int. Cl. H04r 1/10
U.S. Cl. 179—182 R 8 Claims

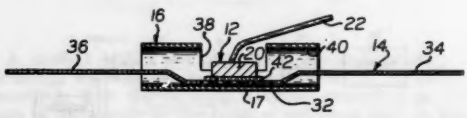


An earpiece consists of a molding of elastomeric material and has a central recess. An electroacoustic transducer capsule is captively held in said recess by resiliently interengaging with said molding. The molding includes a pluglike projection defining a passage therethrough for receiving a guide rod of a headset strap. The walls bounding the passage frictionally engage the guide rod to mount the earpiece thereon for adjustable displaceable movement.

ERRATUM

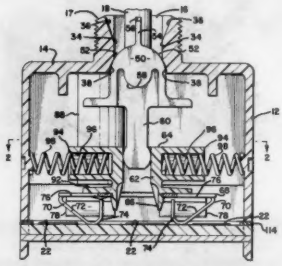
For Class 191—32 see:
Patent No. 3,614,340

3,614,345
THERMAL SENSING DEVICE
Frederic R. Quinn, Red Hook, N.Y., assignor to Zyrotron Industries, Inc., Hackensack, N.J.
Filed Nov. 17, 1969, Ser. No. 877,379
Int. Cl. H01h 9/54
U.S. Cl. 200—2 13 Claims



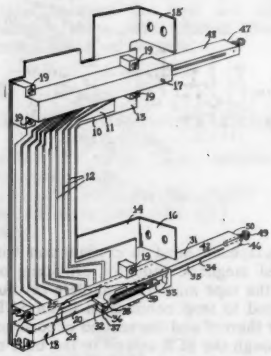
The device is adapted to be used with an external circuit for controlling the operation of associated equipment and comprises sensing means the impedance of which varies in proportion to the ambient temperature. The sensing means is provided with leads to connect the same to the control circuit. In energy exchanging relationship with the sensing means is the heat producing portion of a heater; said heater having terminals for connection to the associated equipment so that the temperature of the heater varies in proportion to a parameter of the associated equipment. An enclosure receives the heat producing portion of the heater and the sensing means therein to concentrate the heat generated by the heater. Additionally, a housing surrounds the enclosure to insulate the enclosure from the external temperature.

3,614,346
RECTILINEARLY MOVABLE SWITCH ASSEMBLY WITH PARTICULAR PIVOTAL ACTUATOR AND FLANGE MEANS
Bernard Vincent Gudaitis, Wilkes-Barre, and Winfield Warren Loose, Harrisburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.
Filed Jan. 12, 1970, Ser. No. 2,291
Int. Cl. H01h 21/24, 21/68
U.S. Cl. 200—16 R 8 Claims



Disclosed is an electrical actuator of the toggle switch variety having contained therein electrical contacts which are reciprocably movable and adapted to slidingly engage the surface of a printed circuit board having circuitry thereon. The circuit board is clamped to the base of the housing, and upon movement of the actuator, the contacts will slidingly engage various circuitry on the printed circuit board surface. The actuator has two pairs of shoulder portions engaging the casing, which restrain the actuator from undesired movement while pivotally mounting it.

3,614,347
SLIDE SELECTOR SWITCH APPARATUS
Raymond G. Castle, Highland Park, Ill., assignor to Cherry Electrical Products Corporation, Highland Park, Ill.
Filed Aug. 25, 1969, Ser. No. 852,778
Int. Cl. H01h 15/00
U.S. Cl. 200—16 R 9 Claims



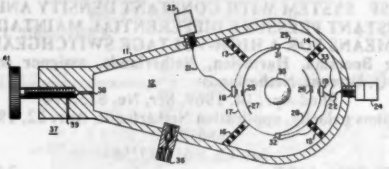
An electrical switching apparatus including a pair of slide switches independently movable over current conducting slider bars which by correlated actuation over printed circuit conductors will establish a common electric circuit therethrough.

3,614,348

PRESSURE RESPONSIVE TIMING DEVICE

Gerald E. Hart, Washington, D.C., assignor to The United States of America as represented by the Secretary of the Navy

Filed Aug. 30, 1965, Ser. No. 484,790
Int. Cl. H01h 43/02
U.S. Cl. 200—33 14 Claims



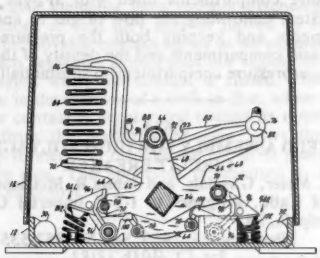
The present invention relates to a time-delay device or timer and more particularly to a mechanical time-delay device having a switch for opening or closing an electric circuit at a selected future time wherein an expansible member within a compressed fluid chamber actuates the switch when the pressure of the chamber decreases.

3,614,349

OVERHOIST LIMIT SWITCH

Herbert Kupsis, Milwaukee, Wis., assignor to Harnischfeger Corporation, West Milwaukee, Wis.

Filed Mar. 2, 1970, Ser. No. 15,505
Int. Cl. H01h 5/10
U.S. Cl. 200—47 6 Claims



An overhoist limit switch including a base having a number of fixed contacts supported thereon and corresponding number of movable contacts mounted on a trip shaft which is journaled for oscillatory motion on the base, an operating shaft journaled in the housing and including a weight arm which responds to overhoist movement, and a trip assembly including a trip plate fixedly secured to the trip shaft and having a cam follower, a rocker arm fixedly secured to the operating shaft, a cam arm pivotally connected to the rocker arm and having an inverted cam positioned to engage the cam follower and a spring to provide a snap action force through the cam arm to the trip plate.

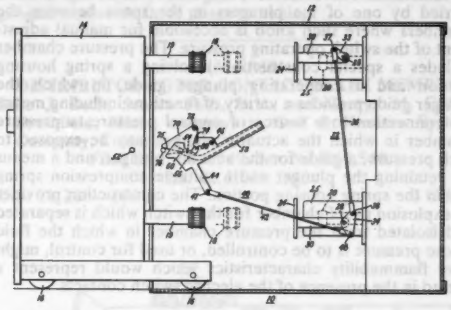
3,614,350

SHUTTER ARRANGEMENT FOR A SWITCHGEAR UNIT

Charles D. Eichelberger, Ridley Park, and Lawrence J. Kosich, Glenolden, both of Pa., assignors to General Electric Company

Filed July 20, 1970, Ser. No. 56,333
Int. Cl. H02b 11/22
U.S. Cl. 200—50 AA 5 Claims

A switchgear unit comprises a cubicle having two groups of stationary disconnect contacts and two shutters for controlling access to the stationary contacts. The shutters are pivotally mounted on the cubicle for motion about vertically spaced horizontal axes between blocking and nonblocking positions with respect to the contacts. A linkage interconnecting the two shutters causes pivotal motion thereof to occur in unison and in opposite angular directions with respect to each other. The weight of one pivotally



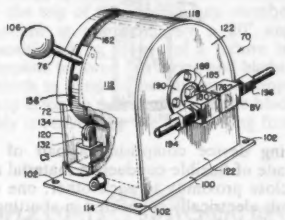
mounted shutter counterbalances the weight of the other during their oppositely directed movement between blocking and nonblocking positions, thus reducing the force needed to operate the pivotally mounted shutters.

3,614,351

PRESSURE CONTROL SYSTEM FOR A GRINDING MACHINE AND ACTUATING UNIT THEREFOR

Robert J. Wojcik, Melrose Park, Ill., assignor to Pettibone Corporation, Chicago, Ill.

Filed Oct. 24, 1969, Ser. No. 869,071
Int. Cl. H01h 9/06
U.S. Cl. 200—61.86 4 Claims



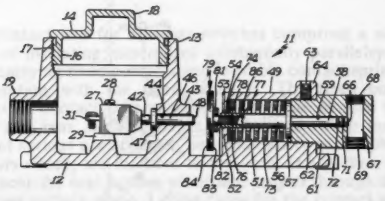
A mechanically operable control unit for regularly bleeding a fluid line to relieve the pressure of fluid therein. A manipulating handle functions initially to establish an electric circuit through the solenoid winding of a directional valve, the handle functioning thereafter to regulate the flow of fluid through a bleed valve which reduces the pressure by an amount proportional to the forward throw of the handle.

3,614,352

PRESSURE CONTROL ASSEMBLY WITH TWO SWITCH HOUSINGS AND AN OPEN SPACE BETWEEN THE PRESSURE SOURCE AND CONTACTS

Richard V. Wiese, Minneapolis, Minn., assignor to Graco Inc., Minneapolis, Minn.

Filed Mar. 31, 1970, Ser. No. 24,283
Int. Cl. H01h 35/38
U.S. Cl. 200—82 C 12 Claims



A pressure control unit includes a housing having spaced wall portions defining a switch chamber and a separate

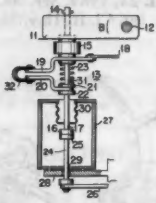
pressure responsive actuator chamber. Cooperating switch actuating and pressure responsive actuator plungers in the walls of the respective chambers are aligned with each other for operation of the switch in response to pressure responsive movement of the actuator plunger. An adjusting knob is carried by one of the plungers in the space between the chambers where such knob is accessible for manual adjustment of the switch operating pressure. The pressure chamber includes a special construction involving a spring housing portion and a cooperating plunger guide, in which the plunger guide provides a variety of functions including means for connection to a source of control pressure, a pressure chamber in which the actuator plunger may be exposed to such pressure, a guide for the actuator plunger, and a means for retaining the plunger and a suitable compression spring within the spring housing portion. The construction provides an explosion proof chamber for the switch which is separated and isolated from the pressure chamber in which the fluid whose pressure is to be controlled, or used for control, might have flammability characteristics which would represent a hazard in the presence of the electric switch contacts.

3,614,353

SWITCHING DEVICE HAVING ELECTRO-MAGNETIC MEANS FOR INCREASING EFFECTIVE CONTACT PRESSURE

Toshihiko Yoshio, Tokyo, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed May 27, 1969, Ser. No. 828,270
Claims priority, application Japan, May 30, 1968, 43/36335
Int. Cl. H01h *33/66*
U.S. Cl. 200—144 B **5 Claims**



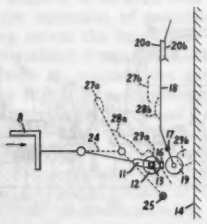
A switching device comprising a pair of bent circuit members made of flexible conductive material and arranged parallel in close proximity to each other, one of which has one of its ends electrically connected in abutting relationship to one end of at least one movable member of a pair of circuit switching electrodes and the other of which is pressed downward to the other end of said movable electrode by means of its operating mechanism, whereby there is generated in the paired bent circuit members a repulsive force opposing that occurring in said two electrodes at the time of conduction.

3,614,354

ELECTRIC SWITCH HAVING OPPOSITELY OPERATING DUAL CONTACTS

Hiroshi Koike, and Rokuro Fujita, both of Tokyo-to, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, a/k/a Tokyo Shibaura Electric Co., Ltd., Kanagawa-ken, Japan

Filed Aug. 29, 1969, Ser. No. 854,142
Claims priority, application Japan, Sept. 4, 1968, 43/63074
Int. Cl. H01h *33/12*
U.S. Cl. 200—146 R **4 Claims**



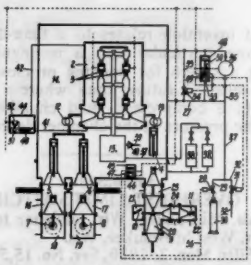
In an electric switch for use in inductive circuits including main contacts connected in series with the circuit and short circuit contacts connected in parallel with the circuit, both of the main and short circuiting contacts are driven by a common source of motive power through discrete operating mechanisms. The operating mechanism for the short circuiting contacts includes a lever of variable length which is connected to a contact carrying arm through a lost motion coupler.

3,614,355

SF SYSTEM WITH CONSTANT DENSITY AND CONSTANT PRESSURE DIFFERENTIAL MAINTAINING MEANS FOR A HIGH-VOLTAGE SWITCHGEAR

Rintje Boersma, Harmelen, Netherlands, assignor to N.V. COQ, Utrecht, Netherlands

Filed Apr. 14, 1969, Ser. No. 815,674
Claims priority, application Netherlands, Apr. 22, 1968, 6805638
Int. Cl. H01h *33/56*
U.S. Cl. 200—148 E **7 Claims**



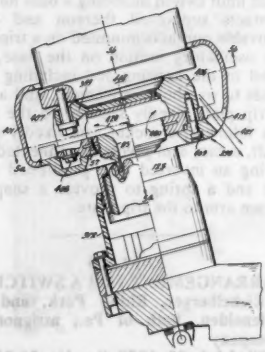
Metal clad switch gear for high voltages comprising switches and accessories, low-overpressure and high-overpressure compartments filled with SF_6-gas and a gas-controlsystem controlling the flow of gas to and from said compartments and keeping both the pressure difference between said compartments and the density of the SF_6-gas in the low-overpressure compartment(s) substantially constant.

3,614,356

SHIELD ASSEMBLY FOR HIGH VOLTAGE GAS CIRCUIT BREAKER

Henry G. Meier, Glendale, and James R. McCloud, Burbank, both of Calif., assignors to I-T-E Imperial Corporation, Philadelphia, Pa.

Filed Aug. 25, 1969, Ser. No. 852,535
Int. Cl. H01h *33/82*
U.S. Cl. 200—148 R **7 Claims**



A high voltage gas circuit breaker has a plurality of interrupter structures, each of which contain an upper stationary contact and corona shield which surrounds the upper contact. The corona shield has openings in a lower rim disposed to direct the gas blast during interruption downwardly and at an angle outwardly from the external surface of its respective interrupter structure from the external surface of its respective interrupter structure to

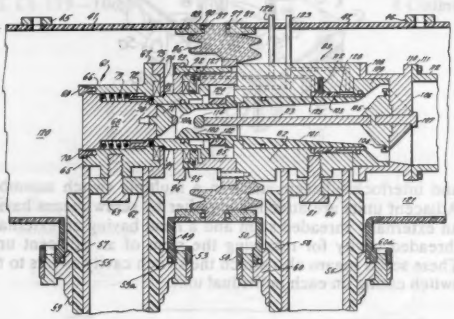
prevent contamination of the insulation surface of the interrupter structure by arc products.

3,614,357

GAS BLAST CIRCUIT INTERRUPTER USING MAIN MOVABLE CONTACT AS BLAST VALVE

Otto Jensen, Malvern, Pa., assignor to ITE Imperial Corporation, Philadelphia, Pa.

Filed May 8, 1969, Ser. No. 823,115
Int. Cl. H01h *33/86, 33/70*
U.S. Cl. 200—148 R **13 Claims**



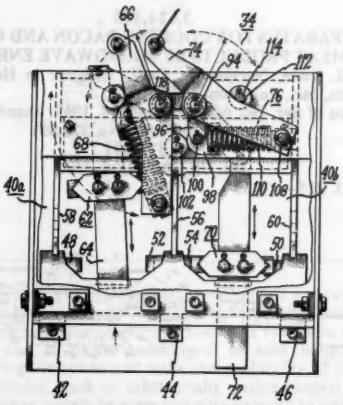
A high-speed gas blast circuit breaker in which SF_6 is used as the mechanical drive for the movable contact and as the dielectric medium for maintaining a high dielectric between the open contacts and for extinguishing arcs. Two or three movable elements are used; an annular movable contact and a cutoff valve and, in some cases, a follower contact. The two elements may be incorporated into one movable body. Each of the movable elements have radially extending surfaces defining pistons so that they may be moved by control air pressure. The movable contact serves as an annular seal in a barrier which separates a high-pressure region from a low-pressure region when the contact is closed. The movable contact acts in the manner of a cork so that, when the seal is broken, the contact is accelerated toward its open position, and fluid from the high-pressure side flows through the annular gap formed and through the arc in its passage to the low-pressure side. The apparatus is mounted in a suitable switch gear enclosure.

3,614,358

OIL IMMERSED SNAP ACTION LOADBREAK SWITCH

Gerald P. Hermann, Pittsfield, Mass., assignor to General Electric Company

Filed Apr. 30, 1970, Ser. No. 33,387
Int. Cl. H01h *33/68*
U.S. Cl. 200—150 R **7 Claims**



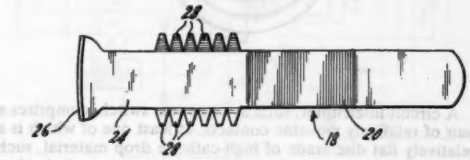
A pair of two position snap action oil immersed switches are provided using an overcenter spring toggle to make or break contacts. Three terminals are provided, one terminal being common to each switch. The movable contacts have a double break to aid in arc interruption and the arc formed on one break tends to force oil across the arc formed at the other break to help interrupt the arc. The switches can be ganged to provide three phase switching.

3,614,359

DISTRIBUTOR ROTOR CONTACT BLADE MEMBER

John J. Beck, Seneca Falls, N.Y., and George M. Gilkey, Southfield, Mich., assignors to Gulf & Western Systems Company, Union Springs, N.Y.

Filed Sept. 24, 1969, Ser. No. 860,540
Int. Cl. H01h *1/00*
U.S. Cl. 200—166 J **2 Claims**



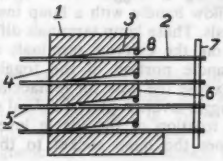
A distributor rotor is disclosed as utilizing a one-piece integral blade and spring with the blade straight or flanged to increase the discharge area. No rivet is required to hold the blade and spring together and the entire distributor rotor therefore can be molded on completely automatic compression molding presses. The one-piece blade and spring has a series of teeth on each side that nest into a slot molded into the top of the rotor sweep member. The teeth are bent upward at approximately a 20° angle and are accurately positioned by means of a fixture on the rotor. Pressure is applied to force the spring and blade into the slot forcing the teeth to bend further upward to approximately a 45° angle. Any effort to pull or dislodge the blade and spring after assembly is resisted by the teeth biting further into the slot walls.

3,614,360

A MULTIPLE CONTACT SWITCHING DEVICE FOR CROSSBAR SWITCHES

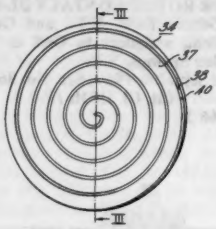
Harald Valdemar Alexandersson, Lidingo, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Nov. 10, 1969, Ser. No. 875,189
Claims priority, application Sweden, Dec. 3, 1968, 16,484/68
Int. Cl. H01h *9/00*
U.S. Cl. 200—166 J **3 Claims**



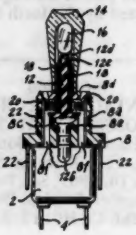
A contact unit for crossbar switches comprises a support body of insulating material of substantially parallelepipedic form carrying fixed contacts and movable contact springs for cooperation with the fixed contacts. The fixed contacts consist of contact bars arranged in a plane parallel to the front and rear surface planes of the body. The movable contact springs are arranged perpendicularly to the plane of the bars which; are fastened to the body at a portion of the same near the rear surface plane and project through slots in the front surface plane. Lifting cards for the contact springs are provided at the movable ends of the springs outside the body.

3,614,361
CONTACT WITH LOW-CATHODE DROP MATERIAL INSERT
Donald E. Weston, Chicago, Ill., assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.
Filed Sept. 10, 1969, Ser. No. 864,926
Int. Cl. H01h 1/02, 1/06
U.S. Cl. 200—166 C 2 Claims



A circuit interrupter, such as a vacuum switch, comprises a pair of relatively movable contacts, at least one of which is a relatively flat disc made of high-cathode drop material, such as molybdenum and having one or more spiral slots extending inwardly from the periphery of the contact filled with solid low-cathode drop material, such as antimony to cause rotation of an arc between said contacts and to facilitate movement of the arc terminal as the arc rotates.

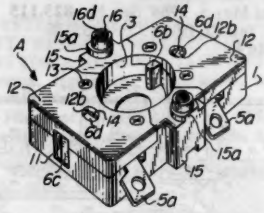
3,614,362
LIGHTED TOGGLE LEVER SWITCH
John J. Keranen, Sussex, Wis., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.
Filed July 28, 1970, Ser. No. 58,944
Int. Cl. H01h 9/18
U.S. Cl. 200—167 A 10 Claims



A switch having a toggle lever including a snap-on transparent, hollow handle with a lamp inside connected to external terminals. These lamp terminals differ in appearance and location from the external terminals connected to the switch. The handle portion of the toggle lever is easily removable to expose the bulb for replacement in the socket built into the toggle lever. A pair of helical springs positioned at the axis of rotation of the toggle lever form electrical connections from the lamp socket to the external, lamp terminals.

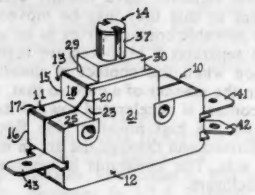
3,614,363
CAM SWITCH UNIT
Teizo Fujita, 3-34, Naka, Tezukayama, Sumiyoshi-ku, Osaka, Japan
Filed July 11, 1969, Ser. No. 840,982
Claims priority, application Japan, Nov. 18, 1968, 43/84,280
Int. Cl. H01h 9/02
U.S. Cl. 200—168 A 5 Claims

A cam switch unit that can be used singly or in multiples operated by a common actuating means. Each cam switch unit comprises an operating cam mounted centrally in a casing, and a pair of switch housing cavities, one on each side of the operating cam. The cavities each contain a fixed contactor and a movable contactor operated by the cam. Each cavity is closed by a cover, and each switch unit further comprises an upright cylindrical portion on the top of the casing and a cavity in the bottom of each casing for receiving the upright cylindrical portion of an adjacent unit to align



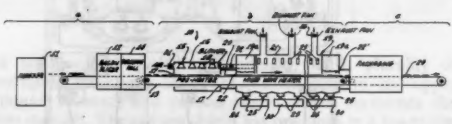
and interlock adjacent units in a multiple switch assembly. Adjacent units are attached together by screw means having an externally threaded stem and a head having an externally threaded cavity for receiving the stem of an adjacent unit. These screw means also attach the switch cavity covers to the switch casing on each individual unit.

3,614,364
ANTIWOBBLE ACTUATOR FOR AN ELECTRIC SWITCH
Michael F. Bedocs, Highland Park, Ill., assignor to Cherry Electrical Products Corporation, Highland Park, Ill.
Filed Feb. 27, 1970, Ser. No. 15,158
Int. Cl. H01h 3/12
U.S. Cl. 200—172 R 2 Claims



An actuator and switch structure comprising cooperative configurated structural elements that prevent wobble, rotation or distortional movement of the actuator during its linear reciprocal movement relative to the switch components contained within the switch housing.

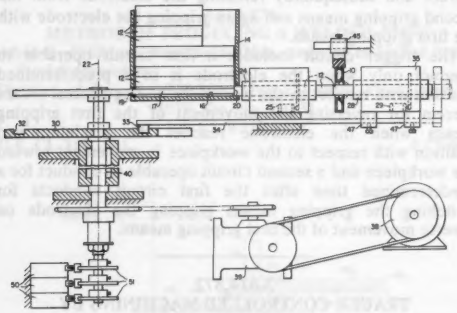
3,614,365
APPARATUS FOR COOKING BACON AND OTHER MEAT PRODUCTS BY MICROWAVE ENERGY
Alan B. Lane, Northridge, Calif., assignor to Hunt-Wesson Foods, Inc., Fullerton, Calif.
Division of Ser. No. 646,008, June 14, 1967, abandoned. Filed Sept. 19, 1969, Ser. No. 870,891
No. 870,891
Int. Cl. H05b 4/06, 5/00
U.S. Cl. 219—10.55 2 Claims



Apparatus for cooking cold or refrigerated bacon and other meat products comprising means for preheating the

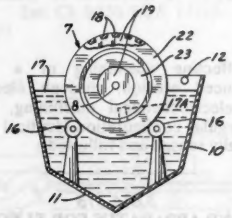
bacon by means, other than by microwave energy, to a temperature above about 60° F. and preferably below about 90° F. and thereafter further heating the meat product, in a microwave, energy zone until it is properly cooked.

3,614,366
CAM FEED SCANNER-TYPE INDUCTION HEATING APPARATUS
Arthur A. Huchok, Towson, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Jan. 30, 1970, Ser. No. 7,075
Int. Cl. H05b *5/00, 1/02*
U.S. Cl. 219—10.69 4 Claims



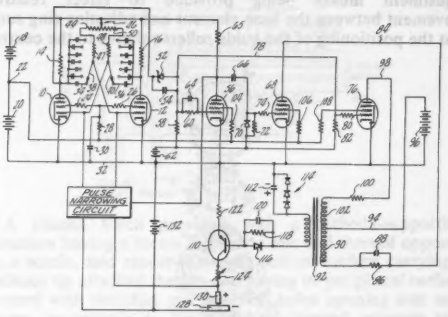
Improvements in an induction heating apparatus which employs a constant rise feed cam that shoves a line of end-to-end workpieces toward an integral quench induction heating coil for scansion of the leading workpiece, and a cam operated collet for completing scansion of such leading workpiece. Means are provided for preventing overheating of certain length workpieces that tend to come to rest in the heating coil during workpiece-introducing and slack-gathering portions of the feed cam cycle, and for increasing speed of operation of the feed cam during such slack-gathering period.

3,614,367
ELECTRIC ARC CAN INCINERATOR
Paul J. Johnson, 1597 Allen Road, Milan, Mich.
Filed Feb. 11, 1970, Ser. No. 10,558
Int. Cl. B23p *1/08;* H05b *7/18*
U.S. Cl. 219—69 M 1 Claim



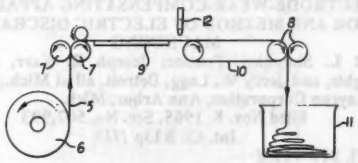
An electric arc, can incinerator, consisting of a receptacle having a liquid therein, and means to charge and discharge the receptacle with the liquid. A cylinder is rotatable in the receptacle, and is partly submerged in said liquid, the cylinder having dielectric end walls and a plurality of closely spaced electrodes, each of substantially wedge shaped cross section. A power supply imparts opposite polarity to adjacent electrodes.

3,614,368
ELECTRICAL DISCHARGE MACHINING SHORT CIRCUIT PROTECTION SYSTEM OF THE KEYED TYPE
Walter Lobur, Clawson, Mich., assignor to Elox Inc., Troy, Mich.
Continuation-in-part of application Ser. No. 617,700, Feb. 21, 1967, now Patent No. 3,515,838. This application Jan. 9, 1970, Ser. No. 1,732
Int. Cl. B23k *9/16*
U.S. Cl. 219—69 P 6 Claims



A circuit for providing machining pulse off-time control responsive to gap short circuit condition and responsive to gap open circuit condition. During the aforesaid short circuit condition, machining current is reduced by increasing machining pulse off-time. However, the pulse on-time is maintained constant and is substantially the same as before the occurrence of either gap short circuit or open circuit condition.

3,614,369
METHOD OF AND APPARATUS FOR CUTTING CLOTH
John A. Medley, Leeds, England, assignor to Wool Industries Research Association, Leeds, England
Filed Sept. 17, 1968, Ser. No. 760,204
Claims priority, application Great Britain, Sept. 21, 1967, 43038/67
Int. Cl. B26d *1/00;* B26f *3/00, 3/14*
U.S. Cl. 219—10.43 8 Claims

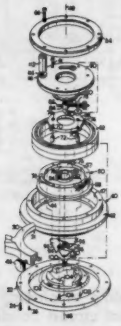


Cloth continuously moved under tension through a cutting zone, and cut by means having applied to it a component of motion oblique to the direction of movement of cloth. Movement of cutter may be controlled by a programmed means, e.g., a magnetic tape fed information by a computer, and feedback means for controlling position of cutter.

3,614,370
ELECTRODE HOLDER
Caroli Italo, Westmount, Quebec, Canada, assignor to DBM Industries Limited
Filed Nov. 18, 1970, Ser. No. 90,673
Claims priority, application Canada, Sept. 21, 1970, 93,611
Int. Cl. B23p *1/08, 1/04*
U.S. Cl. 219—69 E 6 Claims

An electrode holder is described that is adapted to be used with an electric discharge machine which has an electrically conductive electrode. The electrode holder has a main

housing that is generally annular to define a central opening having a central axis along which the electrode is fed during use. A base element is rotatably supported by the main housing, within the central opening. An adjusting ring is also supported by the base element to be movable relative thereto. The adjusting ring is provided with stop means which extend through cooperating slots provided in the base element. Electrically nonconductive guide rollers are disposed symmetrically about the central axis to guidingly engage the electrode. These guide rollers are supported by the base element and are biased against the stop means, with adjustment means being provided to effect relative movement between the base element and adjusting ring such that the positioning of the guide rollers relative to the central



axis can be varied. In one preferred form, the main housing of the electrode holder is adjustably supported in a collar provided on a support stand. Also, preferably, the stop means on the adjusting ring includes a plurality of symmetrically mounted pins, at least one of which is independently rotatable and provided with a section that moves eccentrically relative to the axis about which the pin rotates, for enabling independent adjustment of an associated one of the guide rollers. In another embodiment, the base element in the electrode holder is provided with a drive post, a shoulder, or similar abutment which is engaged by a driving element or member on the electrode discharge machine causing the base element to be rotatively moved about the central axis.

3,614,371

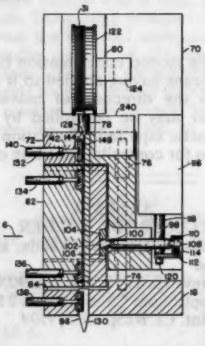
ELECTRODE-WEAR-COMPENSATING APPARATUS FOR AND METHOD OF ELECTRIC DISCHARGE MACHINING

Robert L. Simpkins, Pontiac; Joseph R. Karr, Dearborn Heights, and Jerry W. Lagg, Detroit, all of Mich., assignors to Raycon Corporation, Ann Arbor, Mich.

Filed Nov. 8, 1965, Ser. No. 507,993

Int. Cl. B23p *1/14*

U.S. Cl. 219—69 V **9 Claims**



Apparatus for and a method of electrical discharge machining of small holes in an electrically conducting workpiece is disclosed including specific electrode feeding structure and a unique trigger circuit. The electrode feeding structure is responsive to the trigger circuit for feeding a wire electrode operable in conjunction with the electrical discharge machining structure an amount after each operation of the machining structure determined by the erosion of the electrode in the previous operation of the machining structure.

The electrode feeding includes first electrode gripping means, means for moving the first electrode gripping means and the electrode gripped thereby toward a workpiece, second gripping means and means responsive to the trigger circuit on movement of the electrode into contact with the workpiece for releasing the electrode from the first gripping means, clamping the with the second gripping means, returning the first gripping means to the initial position thereof and subsequently releasing the electrode from the second gripping means and again gripping the electrode with the first gripping means.

The trigger circuit includes a first circuit operable to conduct only when the electrode is in a predetermined position with respect to the workpiece having control means therein for reversing the movement of the first gripping means when the electrode reaches the predetermined position with respect to the workpiece in movement toward the workpiece and a second circuit operable to conduct for a predetermined time after the first circuit conducts for switching the gripping means gripping the electrode on reverse movement of the first gripping means.

3,614,372

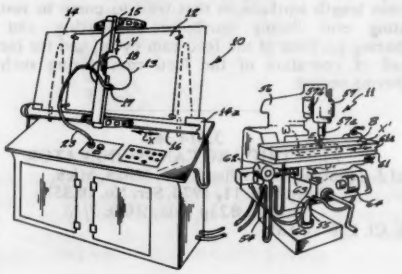
TRACER CONTROLLED MACHINING BY ELECTRICALLY INDUCED EROSION

David H. Dulebohn, Minneapolis, Minn., assignor to Andrew Engineering Company, Hopkins, Minn.

Continuation-in-part of application Ser. No. 784,453, Dec. 17, 1968, now abandoned. This application Dec. 4, 1969, Ser. No. 882,213

Int. Cl. B23k *9/16, 9/12*

U.S. Cl. 219—69 E **13 Claims**



Apparatus effecting machining of a workpiece by electrically induced erosion, through electric discharge machining or electrochemical machining, the machining following an irregular configuration identical to the shape of a drawing optically sensed and followed.

3,614,373

METHOD AND APPARATUS FOR ELECTRICALLY DEPOSITING METAL

Edwin E. Skilling, 1481 Third Ave., Chula Vista, Calif.

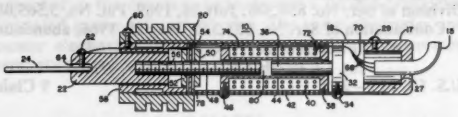
Filed Feb. 12, 1969, Ser. No. 798,701

Int. Cl. B23k *9/16*

U.S. Cl. 219—69 V **10 Claims**

Method and apparatus for electrically depositing metal from an electrode into the surface of the base member by a hand held unit, which unit continuously vibrates the electrode into indentation contact with the base member surface and with a continuous spark discharge of electrical power having a relatively high voltage and a relatively low

current, which electrical power to the unit is automatically turned off after a given interval following separation of the



electrode and the base member and is automatically turned on by placing the electrode within spark discharge distance of the base member.

3,614,374

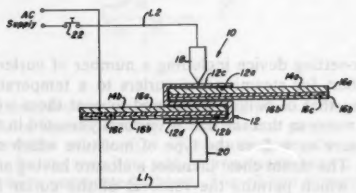
METHOD OF PRODUCING A WELDED JOINT

Alvin R. Williams, Northfield, Ohio, assignor to United States Steel Corporation

Division of Ser. No. 828,296, May 27, 1969. Filed June 30, 1970, Ser. No. 51,131

Int. Cl. B23k *9/28*

U.S. Cl. 219—91 **4 Claims**



The method of making a welded joint includes the steps of positioning the S-shaped metal connector provided with a first laminate cavity and a second laminate cavity, disposing the first adhesively bonded laminate in the first laminate cavity, disposing the second adhesively bonded laminate in the second laminate cavity, and welding the first adhesively bonded laminate and the second adhesively bonded laminate to the metal connector.

3,614,375

WELDING OF SHEET METAL COATED WITH LAYERS

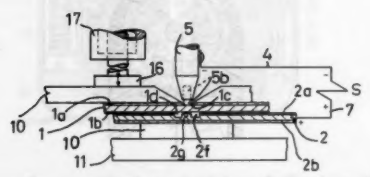
Otto Alfred Becker, 59 Robert Kock Strasse D-6600, Saarbruken, 6, Germany

Filed May 8, 1969, Ser. No. 823,077

Claims priority, application Germany, May 8, 1968, May 28, 1968, Aug. 19, 1968, Sept. 3, 1968, Jan. 17, 1969, Sept. 17, 1968, P 17 65 366.6;P 17 65 489.6;P 17 65 970.0;P 17 90 058.2;P 19 02 569.5;P 17 90 142.7

Int. Cl. B23k *9/28, 11/10*

U.S. Cl. 219—91 **7 Claims**



A method for the connection of sheet metal panels coated on at least one surface with an insulating layer by the electrical fusion of a metal, wherein the improvement comprises the steps of supplying an electric current for the fusion of metal indirectly along the sheet metal of at least one panel to the zone at which said panels are to be connected to each other, and keeping the temperature of an outer insulating layer of at least one of said panels below the melting point of said layer.

3,614,376

PLASMA TORCH

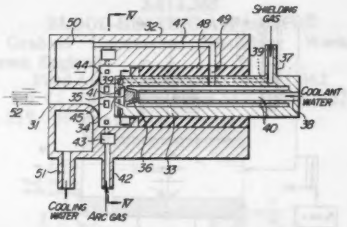
Tosikatu Manabe, Hachioji-shi; Tetsuo Gejyo, Tokyo, and Yasuzi Hamura, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 6, 1969, Ser. No. 847,948

Claims priority, application Japan, Aug. 7, 1968, 43/55511

Int. Cl. B23k *9/00*

U.S. Cl. 219—121 P **11 Claims**



A plasma torch provided with a cathode-supporting structure having a recess formed at one end thereof opposed to a nozzle, said recess having its bottom surface carrying a cathode tip attached thereto and having its peripheral surface formed with shielding gas injection holes opening into said recess tangentially to the periphery thereof, wherein said shielding gas injection holes are located at a distance from the electron emission surface of said cathode tip and the diameter of said recess at its opening end is smaller than the diameter of said recess at the portion thereof where said shielding gas injection holes are formed.

3,614,377

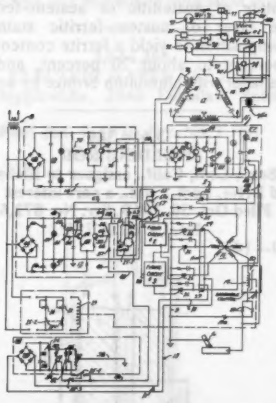
ARC WELDING SUPPLY HAVING MULTIPLE CONTROL SYSTEM

James B. Stearns, Elm Grove, and Robert W. Wendelburg, Milwaukee, both of Wis., assignors to Chemetron Corporation, Chicago, Ill.

Filed Apr. 25, 1969, Ser. No. 819,238

Int. Cl. B23k *9/10*

U.S. Cl. 219—131 R **9 Claims**

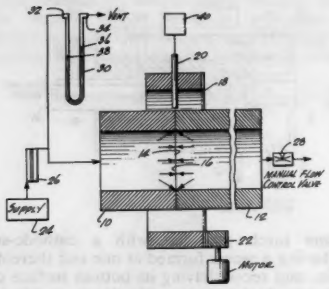


An arc welding supply having a three-phase transformer and a full-wave rectifier including a plurality of controlled rectifiers. A feedback control system is provided for controlling the firing of the controlled rectifiers. The feedback control system includes a first adjustable potentiometer means connected to establish a first output voltage and current and a second adjustable potentiometer means connected in parallel with the first adjustable potentiometer means to establish a different setting for the output characteristic. A relay control circuit energized from the triggers of a pair of torches are connected to selectively insert only one of the potentiometer means into the feedback control system.

3,614,378
FLUXLESS HIGH-FREQUENCY ALUMINUM TUBE WELDING WITHOUT INSERTS

Stuart E. Goodell, Playa Del Rey, and Gerald R. Stoeckinger, Los Angeles, both of Calif., assignors to McDonnell Douglas Corporation

Filed Nov. 28, 1969, Ser. No. 880,737
Int. Cl. B23k 9/00
U.S. Cl. 219—137 4 Claims



A method of fillerless butt welding hot crack sensitive aluminum tubing with high-frequency current pulsation with continuous pressure purging as a means of eliminating flux and improving weld bead contour.

3,614,379
METHOD OF MANUFACTURING ALUMINUM BRONZE-STAINLESS STEEL BIMETALLIC PLATES

Jacques Troton, Fraisse, France, assignor to Compaign Des Ateliers et Forges de la Loire, Paris, France

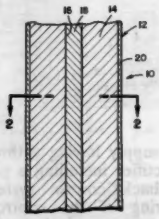
Filed Oct. 27, 1969, Ser. No. 869,899
Claims priority, application France, Oct. 28, 1968, 171,178
Int. Cl. B23k 9/00
U.S. Cl. 219—137 7 Claims

A method of manufacturing bimetallic plates of aluminum bronze and stainless steel by loading by means of blow torch on a baseplate of austenitic or austeno-ferritic steel an intermediate layer of austeno-ferritic stainless steel of adequate composition to yield a ferrite content ranging from about 10 percent to about 20 percent, and loading said intermediate layer with aluminum bronze by arc-welding.

3,614,380
WELDING ROD

Warren E. Bray, Lodi, Calif., assignor to Richard E. Warner, Edgewood Drive, Lodi, Calif., a part interest

Filed Oct. 30, 1969, Ser. No. 872,613
Int. Cl. B23k 35/22
U.S. Cl. 219—146 5 Claims

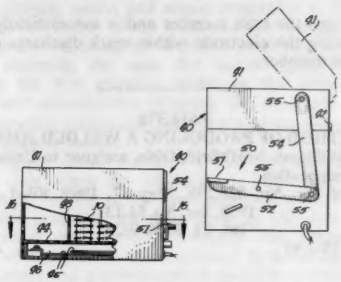


A welding rod comprised of a tubular body of welding material capable of fusing to provide a weld. The body has a bore therethrough longitudinally thereof, the bore being substantially filled with a mass of solder. The welding rod is especially adapted for welding an aluminum body to a body of another material.

3,614,381
HAIR-SETTING DEVICE

Samuel J. Popeil, Chicago, Ill., assignor to Popeil Brothers, Inc., Chicago, Ill.

Division of Ser. No. 850,308, July 28, 1969, Pat. No. 3,565,083, Continuation of Ser. No. 551,320, May 19, 1966, abandoned.
Filed June 26, 1970, Ser. No. 50,166
Int. Cl. H05b 3/60; A45d 2/14, 4/10
U.S. Cl. 219—222 9 Claims

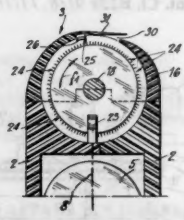


A hair-setting device including a number of curlers and a steam chest for steaming the curlers to a temperature not exceeding that of boiling water and to coat them with pure distilled water so that the hair is uniformly treated in terms of temperature as well as the type of moisture which contacts the hair. The steam chest includes a closure having an access opening which permits the removal of the curler from its interior, the curler being supported out of contact with the water which is boiled in the steam chest to steam the curler. The curler has a tubular hollow body and has good moisture and heat retention characteristics which permits the same to retain a temperature in the hair of not less than approximately 150° F. for a minimum of approximately 2 minutes after being heated in and removed from a 212° F. aqueous environment.

3,614,382
ELECTRIC SHAVING APPLIANCE

Eugene Jim Politzer, 65, rue Jouffroy, Paris, 17 eme, France

Filed Jan. 24, 1969, Ser. No. 793,737
Claims priority, application France, Dec. 3, 1968, P.V. 176443
Int. Cl. H05b 1/00; A45d 26/00
U.S. Cl. 219—223 14 Claims



An apparatus is provided for the elimination of superfluous hair. Such appliance comprises a body having a working head including a hood which has an open work protecting member for engaging the hair inside the head. A revolving member is mounted for rotation in the hood in confronting relation to the open work member. A counter electrode is provided which is coextensive in length with the revolving member and is positioned within the hood immediately adjacent the open

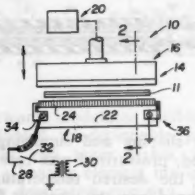
work member. A row of spike electrodes extends along the length of the revolving member and an electrode circuit, connected to a source of power, has a first conductor connected to the counter electrode and a second conductor connected to the spike electrodes. The spike electrodes and counter electrode are so spaced that sparks are generated therebetween when the circuit is energized.

3,614,383

IMPULSE HEATING DEVICE FOR USE WITH THERMOPLASTIC MATERIALS AND METHOD

Ridley Watts, Jr., Cleveland, Ohio, assignor to The American Packaging Corporation, Hudson, Ohio

Filed Aug. 15, 1969, Ser. No. 869,420
Int. Cl. H05b *1/00*
U.S. Cl. 219—243 **14 Claims**



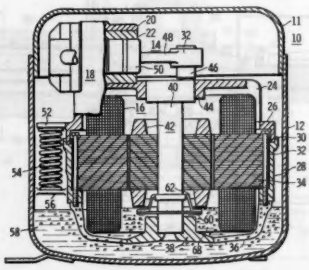
Apparatus for cutting and/or sealing plastic film, including an impulse-heated cutting device and a pressure pad on opposite sides of the film. The cutting device includes a support frame member and a resistance-heated element formed by a corrugated ribbon. The ribbon is supported in the frame by dielectric material. An edge of the ribbon projects from the frame toward the pressure pad and engages the plastic film for cutting and/or sealing the film when the film is compressed between the pressure pad and the resistance element.

3,614,384

MOTOR COMPRESSOR UNIT WITH REDUCED NOISE TRANSMISSION

Regis D. Heitchue, Sr., Columbus, Ohio, assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 16, 1970, Ser. No. 11,451
Int. Cl. F04b *21/00, 17/00*
U.S. Cl. 417—312 **6 Claims**



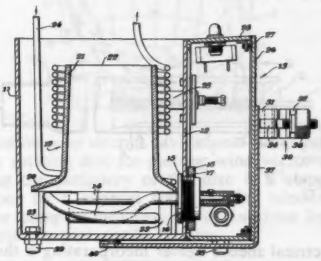
In accordance with the principles of the invention, a compressor is provided in a hermetically sealed enclosure with the crankshaft of the compressor being permitted to extend downwardly into the area where lubricating oil is contained within the hermetically sealed enclosure. Mounted on the crankshaft, below the rotor of the electric motor driving it but above its thrust and journal bearing is a stirring member. The stirring member comprises a flat, annular disc which is welded to a spider member so that the annular disc is disposed in an angle relative to the axial length of the crankshaft. Because of the angular offset of the annular disc and its disposition in the oil in the lower part of the hermetically sealed enclosure, rotation of the crankshaft occasions stirring of the oil thereby producing bubbles in the oil body. This lessens the sound transmission quantities of the oil so that a portion of the noise due to the rotation of the electric motor and the operation of the compressor is attenuated and not transmitted outwardly of the hermetically sealed enclosure.

3,614,385

BLOOD-HEATING APPARATUS

Bevan Graham Horstmann, Newbridge Works, Bath, Somerset, England

Filed Aug. 19, 1969, Ser. No. 851,362
Int. Cl. H05b *1/00;* **A61m** *5/00;* **B67d** *5/62*
U.S. Cl. 219—303 **2 Claims**



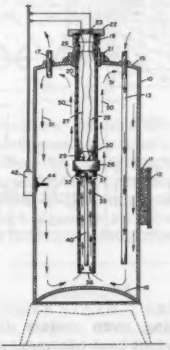
Apparatus for heating blood required for transfusion purposes which enables blood newly drawn from the cold store to be used immediately and without waste. A water tank is provided with a submerged broad based chimneylike convection device having a removable blood-heating coil wound round its outside. An electric heater below the convection device causes heated water to rise up the center and fall around the blood-heating coil. A thermostatic control ensures that the blood is heated to the correct temperature and indicating and other safety devices ensure correct functioning and immediate indication of any failure.

3,614,386

ELECTRIC WATER HEATER

Gordon H. Hepplewhite, 3940 Ellendale Road, Moreland Hills, Ohio

Filed Jan. 9, 1970, Ser. No. 1,788
Int. Cl. F24h *1/20*
U.S. Cl. 219—312 **2 Claims**



In accordance with this invention there is provided an electric water heater and storage tank wherein only a single electric heating element is vertically mounted near the

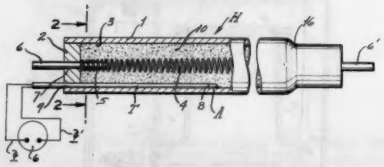
bottom of the tank and is surrounded by a spaced-apart tube which is a good thermal insulator, such as a plastic tube. The insulator tube is open at the bottom for cold water inlet and has openings at the top for hot water outlet near the middle of the tank, forming a circulating system within the tank to cause cooler water to sweep across the surface of the electric heating element for economy and to greatly reduce stratification of the hot water within the tank.

3,614,387

ELECTRICAL HEATER WITH AN INTERNAL THERMOCOUPLE

Ronald M. Wrob, Sunset Hills, and John B. Kidney, Hazelwood, both of Mo., assignors to Watlow Electric Manufacturing Co., St. Louis, Mo.

Filed Sept. 22, 1969, Ser. No. 859,623
Int. Cl. H05b 1/00
U.S. Cl. 219—328 **9 Claims**



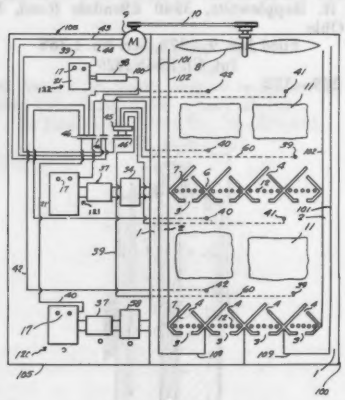
An electrical sheath heater incorporating a thermocouple having its measuring junction end positioned against the inner sheath wall and its other end connected to a temperature gauge exteriorly of the sheath for accurately determining the sheath temperature during usage.

3,614,388

ELECTRIC HEATING OVEN SYSTEM

Aubrey C. Robinson, La Grange, Ga.

Division of Ser. No. 834,727, June 19, 1969, Pat. No. 3,529,358, which is a division of Ser. No. 488,886, Sept. 21, 1965, Pat. No. 3,467,815. Filed June 22, 1970, Ser. No. 48,401
Int. Cl. F27d 11/02
U.S. Cl. 219—400 **2 Claims**



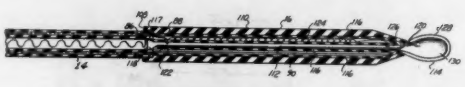
An electric heating oven system for overcoming an erroneous and inefficient heat treatment of materials such as in the deferred curing of textile garments and pieces of goods, metal, wooden, lacquered surfaces, ceramics, and other objects or materials, where it is known that the product heat of materials undergoing heat treatment should be brought up to the last level equal to that of the environmental temperature level which is used to impose the head treatment upon said material without uncontrolled underheating and/or overheating said material in the process, and where the application of such product head should be made in a gradual manner in order to hold peak heat levels to the minimum level required for given results.

3,614,389

ELECTRICALLY HEATED DENTAL WAX SUPPLYING AND MANIPULATING TOOLS

Imre Malisza, 1404 Daugall Ave., Windsor, Ontario, Canada

Filed Jan. 21, 1969, Ser. No. 792,562
Int. Cl. H05b 1/00; F27b 14/06
U.S. Cl. 219—421 **4 Claims**



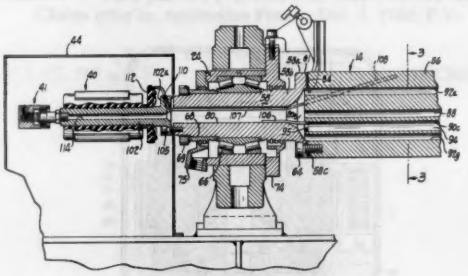
A dental wax shaping and supplying tool includes an electrically heated, pressurized wax reservoir for heating a mass of wax to the desired temperature. Molten wax is selectively discharged from the reservoir through a flow valve in the bottom thereof into an elongated electrically heated flexible tube having connected to its other end an electrically heated spatula for dispensing and shaping the wax. The spatula includes a metallic tube for transmitting the wax from the flexible tube to the spatula spoon. The metal tube is electrically energized to supply heat to the wax flowing therethrough. The wax discharges onto a spatula spoon having an outer rim of electrical resistance material connected to supply heat and a center bowl of electrical insulation.

3,614,390

ROLL MILL AND TEMPERATURE-CONTROLLED ROLL

James T. Matsuoka, Brecksville, Ohio, assignor to Intercole Automation, Inc., Cleveland, Ohio

Filed Nov. 17, 1969, Ser. No. 877,235
Int. Cl. H05b 1/02
U.S. Cl. 219—469 **2 Claims**



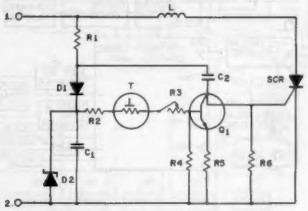
Apparatus of the type used to work or calender materials such as rubber, plastic and the like between parallel-spaced rolls. To facilitate temperature control, a roll has internal heating elements and axially extending passageways, one centrally of the roll and others radially outward from the heating elements for carrying a flow of cooling fluid such as air. The outer passageways are located so that a flow of cooling fluid therethrough will provide a thermal barrier to the flow of heat from the heating means to the roll periphery and will produce a relatively uniform effect upon the temperature throughout the roll surface.

3,614,391

CONTROL CIRCUIT FOR COMPOSITE ELECTRONIC MODULATOR FLEXIBLE HEATING ELEMENT

Peter Lauck, III, Princeton, N.J., assignor to J. P. Stevens & Company, Inc., New York, N.Y.

Filed Aug. 21, 1970, Ser. No. 65,868
Int. Cl. H05b *1/02*
U.S. Cl. 219—501 9 Claims



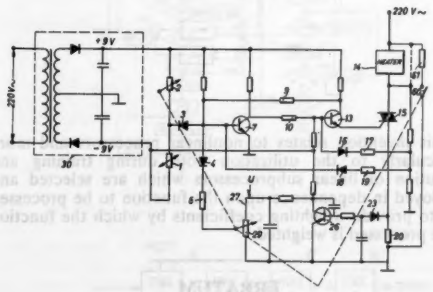
A composite electronic modulator flexible heating element control circuit, adapted to detachable juxtaposition with complemental outer and inner layers, as for example, undersheeting and a heating element insular, nonflammable layer and an outer decorative covering. In this particular circuit, an applied thermistor-sensor is adapted, upon a rise in preselected maximum temperature, to lowering its resistance to fire an NPN transistor to shut off an SCR load. The circuit is stable, sensitive and is particularly adapted to a nonflammable material, having an insular heat shield or ultrafrequency shield with the temperature responsive means being optionally either in the matrix of nonflammable material or in the control plug or control receptacle. It is adaptable to miniaturization by integrated circuit or equivalent means.

3,614,392

REGULATOR FOR A HEATER ELEMENT

Konstantin Apel, Lehrenweg 8, Meersburg, Bodensee, Germany

Filed Oct. 14, 1968, Ser. No. 767,149
Claims priority, application Germany, Oct. 14, 1967, P 16 15 310.9
Int. Cl. H05b *1/02*
U.S. Cl. 219—501 19 Claims



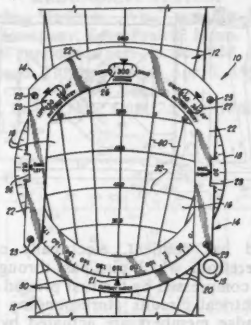
A regulator for supplying control voltage to switch a heater on and off is provided with an OR gate, a control-voltage amplifier, a switching device, a temperature sensing device, and two independent control-voltage generators. One of the generators is connected to the temperature sensing device and the other is connected to power. The output of the control-voltage generators are connected through the OR gate and the control-voltage amplifier to the switching device. The switching device is in circuit with the heater to be controlled.

3,614,393

NAVIGATIONAL COMPUTER

Paul E. Sanderson, Fort Lauderdale, Fla., assignor to Sanderson Films, Inc.

Filed Jan. 27, 1970, Ser. No. 6,074
Int. Cl. G06c *3/00*; G06g *1/00*
U.S. Cl. 235—61 NV 8 Claims



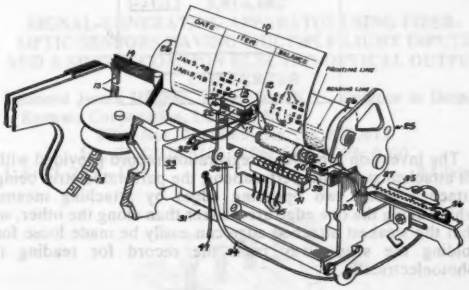
The invention is an aircraft navigational computer having a transparent rotating disc for plotting wind vector solutions. Surrounding the periphery of the disc is a compass rose superimposed by a support frame having windows which indicate the compass headings of the various legs in the landing pattern for any specific runway.

3,614,394

DATA RECORDS, AND DATA RECORDING AND UTILIZING METHODS AND MEANS

Theodore S. Bindshedler, Pompano Beach, Fla., assignor to Burroughs Corporation, Detroit, Mich.

Division of Ser. No. 576,475, Apr. 5, 1945, abandoned, which is a continuation of Ser. No. 237,241, July 17, 1951, abandoned.
Filed May 31, 1963, Ser. No. 285,550
Int. Cl. G06k *3/00*, *7/08*; B41j *27/16*
U.S. Cl. 235—61.9 R 15 Claims



An accounting machine includes means for magnetically recording a new balance on an accounting form and for later sensing the recording to enter such balance into the accumulator of the machine. The magnetic recording is made by impressing deposits of magnetic material from a ribbon onto the form, which deposits are configured so as to be visually readable to facilitate manual checking.

3,614,395

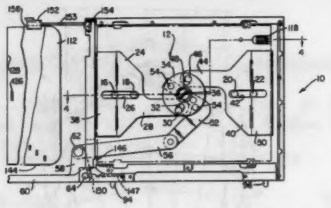
HIGH DENSITY STATIC CARD READER

Everett E. Harshman, Dayton, Ohio, assignor to The National Cash Register Company, Dayton, Ohio

Filed July 24, 1969, Ser. No. 844,587
Int. Cl. E05c *17/44*; G06k *7/04*; H01h *43/08*
U.S. Cl. 235—61.11 C 7 Claims

A compact, manually operated card reader which is especially adaptable for reading punched cards having a high

density of information in them. The reader includes first and second printed circuit boards which are brought together for reading a punched card by a pair of wedge members which displace a pressure plate which develops an even pressure on the first printed circuit board in moving it towards the second printed board during a reading operation. The second printed



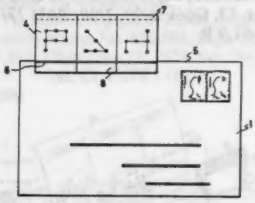
circuit board has resilient, electrically conducting pins projecting therefrom, which pins pass through the holes in a card and are compressed by the first printed circuit board to complete electrical circuits corresponding to holes in the card. The wedge members are actuated by a crank and a connecting lever which is connected to an operating handle on the reader.

3,614,396

REGISTRATION RECORD AND METHOD FOR READING IT

Norbert F. Goldstern, c/o Gloeilampenfabriek Radium N.V. De Regenboogstraat 12, Tilburg, Netherlands

Filed June 20, 1969, Ser. No. 834,955
Claims priority, application Netherlands, July 1, 1968, 6809303
Int. Cl. G06k *19/04;* **G01n** *21/30*
U.S. Cl. 235—61.12 R **8 Claims**



The invention provides a registration record provided with an attached strip with perforations, the perforated strip being attached along two opposing edges by attaching means, which along the one edge are weaker than along the other, so that the weakest attached edge can easily be made loose for folding the strip away from the record for reading it photoelectrically.

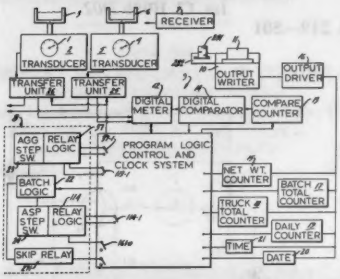
3,614,397

BATCH-CONTROLLED READOUT SYSTEM

Walter L. Probert, and Steven R. Finch, both of Milwaukee, Wis., assignors to Wisconsin Electrical Mfg. Co., Inc., New Berlin, Wis.

Filed Nov. 7, 1969, Ser. No. 874,932
Int. Cl. G06m *3/02*
U.S. Cl. 235—92 WT **25 Claims**

An asphalt-type batching printer unit includes a pair of scale potentiometers sequentially and selectively connected to corresponding batch controls and a counter circuit. The potentiometers are energized from the digital converter of the count circuit. The digital converter and a compare counter are applied to a digital comparator to control a clock pulse source. The clock pulse source is connected to the compare counter and to a net weight counter, a batch total counter, a truck total counter, and a daily total counter. The net weight counter is reset after each printing. During each print, an acknowledge switch is closed to again start the batch control. The aggregate batch control and counters print the aggregate scale tare and deliver several aggregate materials with net weight printing of each. The asphalt scale



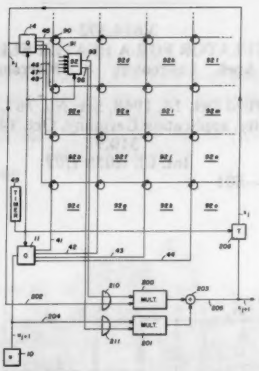
tare is stored and printed after the final aggregate print. The asphalt batch control delivers the asphalt and the amount is printed. After one batch is completed, a batch signal recycles for another batch or finish ticket signal provides readout of the several totaling counters.

3,614,398

LINEAR EMBEDDED NONLINEAR ADAPTIVE PROCESSOR

William C. Choate, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 23, 1968, Ser. No. 785,944
Int. Cl. G05b *13/02*
U.S. Cl. 235—150.1 **10 Claims**



This invention relates to nonlinear processors and more particularly to the utilization both during training and execution of linear subprocessors which are selected and employed in dependence upon the function to be processed and to provide weighting coefficients by which the function to be processed is weighted.

ERRATUM

For Class 235—151.12 see:
Patent No. 3,614,682

3,614,399

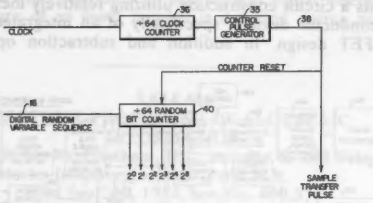
METHOD OF SYNTHESIZING LOW-FREQUENCY NOISE

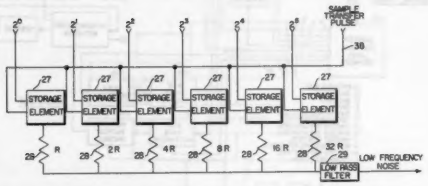
John C. Linz, 2 Jeffrey Circle, Bedford, Mass.

Filed Aug. 30, 1968, Ser. No. 756,519
Int. Cl. G06f *1/02, 7/38*
U.S. Cl. 235—152 **46 Claims**

A method of synthesizing low-frequency noise wherein the low-frequency noise has a controllable amplitude

distribution, so as to be able to select a desired amplitude-level distribution, such as Gaussian, Poisson, or Uniform distribution. The desired amplitude distribution is derived





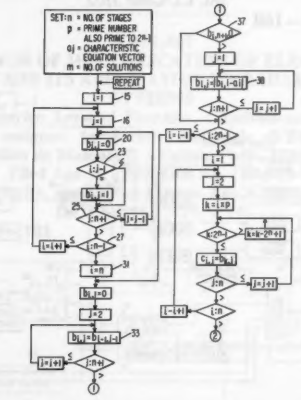
from a digital-random-variable sequence, having a plurality of characteristics, by selecting the characteristic appropriate to the desired amplitude distribution and performing an appropriate digital operation on the selected characteristic.

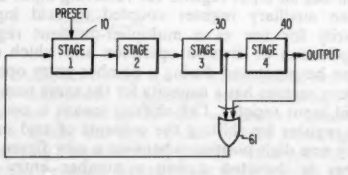
3,614,400

MAXIMUM LENGTH PULSE SEQUENCE GENERATORS

Edward Charles Farnett, Cinnaminson, and Lee Oliver Upton, Jr., Edgewater Park, both of N.J., assignors to RCA Corporation

Filed Nov. 26, 1969, Ser. No. 880,028
Int. Cl. G06f *1/02*
U.S. Cl. 235—152 **2 Claims**





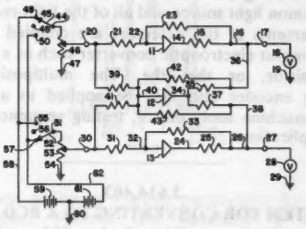
An *n* stage shift register can be operated as a digital pulse sequence generator by feeding back to the first stage the modulo 2 sum of the signals produced by at least two stages of the register. By properly selecting the stages from which the modulo 2 sum feedback signal is derived, the register can be made to produce a pseudo random sequence of 2^n-1 digits (the maximum length sequence possible for *n* stages). This application relates to a machine implemented process for calculating from a specific feedback connection producing a maximum length sequence all other feedback connections that will produce a maximum length sequence.

3,614,401

REDUNDANT SYSTEM

Tenny D. Lode, Madison, Wis., assignor to Rosemount Engineering Company, Eden Prairie, Minn.

Continuation of application Ser. No. 466,928, June 25, 1965, now abandoned. This application Apr. 1, 1969, Ser. No. 812,461
Int. Cl. B64c *13/00*; G08c *25/00*; G06f *11/00*
U.S. Cl. 235—153 **19 Claims**



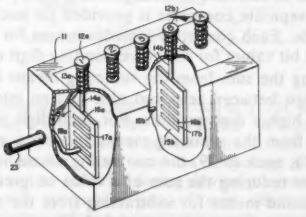
This disclosure shows several forms of multiple channel redundant signal transmission systems which are capable of continued operation in spite of failures of individual transmission elements or channel elements. The redundancy is applied to a multiple channel system as a whole, rather than to individual channels. For example, one additional channel may be used as a redundant backup for two, three or more individual channels to provide continued operation of all channels in spite of a failure in any single channel including the additional channel. The approach is believed to offer significant economics over the more conventional approach of providing separate redundant or backup channels for each individual signal channel.

3,614,402

SIGNAL-GENERATING APPARATUS USING FIBER-OPTIC SENSORS HAVING MULTIPLE LIGHT INPUTS AND A SINGLE COMMON ELECTRO-OPTICAL OUTPUT CONVERTER

Leonard James Higgins, Watervliet, N.Y., assignor to Datacq Systems Corporation, Latham, N.Y.

Filed Nov. 21, 1969, Ser. No. 878,612
Int. Cl. G02b *5/16*; G06f *5/02*; G08c *9/00*
U.S. Cl. 235—154 **8 Claims**



A multiposition encoder for keyboard-actuated devices such as desk calculators and the like is provided and comprises a plurality of individually coded target members with each coded target member being representative of a particular alphanumeric character and being connected to a respective key of the keyboard-actuated device that corresponds to the character represented by the coded target member. A plurality of interrogating sensing and readout detectors in the form of light-transmitting and light-receiving fiber-optic elements are positioned adjacent respective ones of the individual coded target members for sensing and

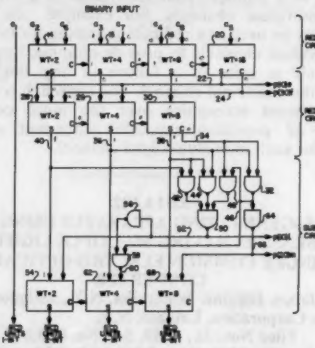
reading out the respective coded characters. Means are provided for selectively individually translating the coded target members past their respective sensing and readout detectors upon actuation of the keys with which they correspond. A common electrooptical converting means is coupled to and supplied from all of the light-receiving and fiber-optic sensors for converting the outputs from the sensing and readout detectors into serial, coded pulsed electric signals representative of the intelligence contained in the selectively actuated keys and their associated coded target members. The encoder may comprise either a separate attachment to an existing equipment such as a desk calculator, or may be fabricated into and comprise an integral part of such equipment. In a preferred arrangement, the light-transmitting fiber-optic elements of all of the respective sensing and readout detectors are supplied from a single common light source and all of the light-receiving fiber optical elements of the detectors are coupled to a single, common output electrooptic converter such as a photocell, a phototransistor, or the like. The multiposition signal-generating encoder also may be applied to a number of different machine tool control, testing sequence and other similar applications.

3,614,403

SYSTEM FOR CONVERTING TO A BCD CODE

Roland Borg Anderson, Silver Spring, Md., assignor to The Bunker-Ramo Corporation, Canoga Park, Calif.

Filed Apr. 22, 1969, Ser. No. 818,367
Int. Cl. H04l 3/00
U.S. Cl. 235—155 **17 Claims**



A static circuit for converting from a binary-based code to BCD. A separate converter is provided for each digit of the BCD code. Each converter includes means for summing the weighted bit values for the corresponding digit and means for converting the sum from the summing means into a binary-coded digit between zero and nine and an integral carry to the next higher digit position. For each digit position where the sum from the summing means exceeds a predetermined value (V), such as 29, the converting means includes a first means for reducing the sum of a value no greater than (V), and a second means for subtracting from the output of said first means an integral multiple of 10 so as to obtain the desired value between zero and nine.

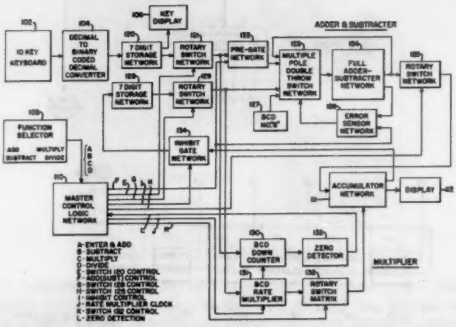
3,614,404

ELECTRONIC CALCULATOR

Mark M. Garfein, Dewitt, N.Y., assignor to General Electric Company

Filed Apr. 17, 1969, Ser. No. 816,965
Int. Cl. G06f 7/48
U.S. Cl. 235—159 **5 Claims**

An inexpensively fabricated electronic calculator for efficiently performing basic mathematical operations including addition, subtraction, multiplication and division is disclosed. In the multiplication operation binary coded numbers are transformed into a unary code using a serial, digit-by-digit technique. A logical design is employed which permits a circuit construction utilizing relatively inexpensive semiconductor devices, specifically of an integrated circuit MOSFET design. In addition and subtraction operations



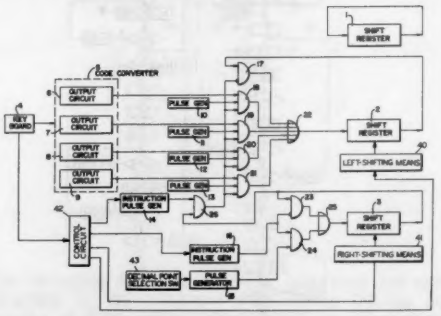
binary-coded decimals are employed throughout, with correction of uncorrected sums being made by suitable modifications of the circuit which permit the adder-subtracter network per se to be traversed twice thereby obviating the need for a separate correction network. A division operation is performed employing multiplication and addition-subtraction circuitry.

3,614,405

NUMBER ENTRY SYSTEM

Goro Hamano, Osaka, and Sadamichi Someda, Kanagawa-ken, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Osaka, Japan

Filed Feb. 26, 1969, Ser. No. 802,387
Int. Cl. G06f 3/02
U.S. Cl. 235—160 **3 Claims**



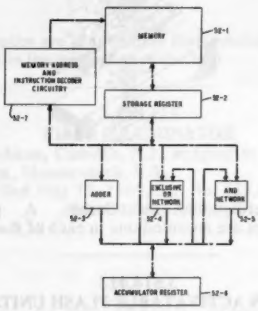
A number entry system for a digital data processor. The system has an input register for receiving input data therein, and an auxiliary register coupled to said input register primarily for use as a multiplier-quotient register for a multiplication or division operation and which contains no data to be processed during a number entry operation. The auxiliary register has a capacity for the same number of digits as said input register. Left-shifting means is coupled to said input register for shifting the contents of said input register left by one digit position whenever a new figure of an input number is detected during a number entry before the position of the decimal point of said input number is designated. Marker signal generating means is coupled to said auxiliary register for setting a marker signal into the "one's" position of said auxiliary register when the first figure of an input number is detected during number entry. Right-shifting means is coupled to said auxiliary register for shifting said marker signal in said auxiliary register right by

one digit position whenever a new figure of an input number is detected during a number entry after the decimal point of said input number has been designated. Input circuit means is coupled to said input register for putting the input figure into the same digit position with said marker signal whenever a new figure of an input number is detected during number entry.

3,614,406
MACHINE PROCESSING OF ALGEBRAIC INFORMATION

William S. Brown, Chatham, N.J., assignor to Bell Telephone Laboratories Incorporated, New York, N.Y.

Filed Sept. 30, 1964, Ser. No. 400,370
Int. Cl. G06f *7/385, 7/39, 7/00*
U.S. Cl. 235—168 **9 Claims**

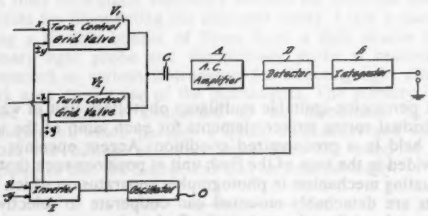


A method and apparatus are disclosed for improving the efficiency of processing and storing algebraic and similar information in a data processor. Polynomial information is treated as an array of coefficient and exponent information subject to machine boundary conditions, user format statements and linking signals. Dynamic storage allocation and exponent overflow are also provided.

3,614,407
METHOD OF MULTIPLICATION OF ELECTRIC SIGNALS AND ITS APPLICATION TO RADAR OR LIKE SYSTEMS

Jacques Maurice Armand Fournier, Chatillon-sous-Bagneux, France, assignor to Societe Nationale D'Etude et de Construction de Moteurs D'Aviation, Paris, France

Filed Apr. 6, 1962, Ser. No. 188,919
Claims priority, application France, Apr. 6, 1961, 857,963
Int. Cl. G06g *7/19, 7/16*
U.S. Cl. 235—181 **4 Claims**

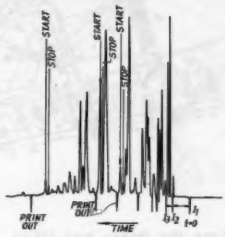


Electronic multiplier device for the treatment of two input signals to be multiplied, comprising two electronic tubes having each two control grids and an anode, means for periodically reversing the sign of one of said input signals, means for applying simultaneously though with opposite signs said periodically reversed signal respectively to one control grid of one tube and to the corresponding control grid of the other tube, means for applying simultaneously though with opposite signs the other of said input signals respectively to the other control grids of said tubes, means for collecting the sum of the anode currents of said tubes, and an alternating current amplifier having its input connected with said last-mentioned means.

3,614,408
WAVEFORM ANALYZING SYSTEM, PARTICULARLY FOR CHROMATOGRAPHS, WHEREIN THE WAVEFORM IS INTEGRATED BETWEEN SELECTED PEAKS AND VALLEYS

Brian L. H. Watkin; Norman Evans, and Ronald J. K. Arnold, all of Sunbury-on-Thames, Middlesex, England, assignors to The British Petroleum Company Limited, Moor Lane, London, England

Filed Feb. 20, 1969, Ser. No. 800,907
Int. Cl. G06g *7/18, 7/19*
U.S. Cl. 235—183 **10 Claims**

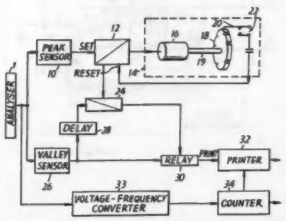


A waveform analyzing system, particularly for use with chromatographs, wherein the waveform is integrated between selected peaks and valleys thereof, wherein a recycling timing device is used to reset the time scale to zero at selected points of the waveform, and wherein printout of the integrated values can be obtained at selected peaks and/or valleys of the waveform.

3,614,409
TIMING DEVICE, PARTICULARLY FOR CHROMATOGRAPHS

Brian Leslie Highford Watkin, Sunbury-on-Thames, Middlesex, England, assignor to The British Petroleum Company Limited, Moor Lane, London, England

Filed Feb. 20, 1969, Ser. No. 800,897
Claims priority, application Great Britain, Feb. 22, 1968, 8772/68
Int. Cl. G06g *7/18*
U.S. Cl. 235—183 **17 Claims**



A waveform-analyzing system, particularly for use with chromatographs, wherein the waveform is integrated between selected characteristic points thereof, and selected peaks of the waveform are used as recycling zero time markers which act to restart a timing device programmed to stop before each successive one of said selected peaks instead of operating relative to a continuously running time scale defined by a single point at the beginning of the waveform.

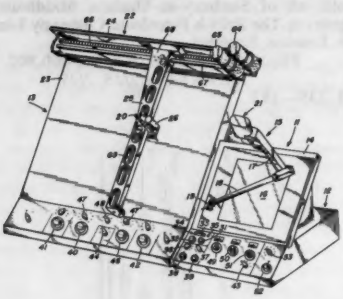
3,614,410
IMAGE RECTIFIER

Knight V. Bailey, Ferndale, and Dudley P. Hattaway, Madison Heights, both of Mich.

Filed June 12, 1969, Ser. No. 832,808
Int. Cl. G06g *7/22*
U.S. Cl. 235—186 **19 Claims**

This invention is directed to an apparatus that plots an orthogonal projection of a photograph or similar image

which was taken at an angle to the earth's surface. A stylus is used to outline the image which is to be rectified. The *x* and *y* cartesian coordinates of the stylus position are fed to an analog computer together with data relating to the camera's



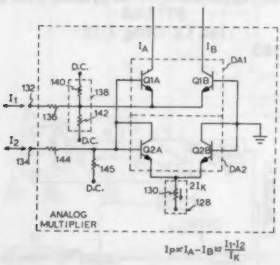
position at the time the image was taken. The computer, utilizing trigonometric relationships, calculates rectified equivalents of the *X*, *y* coordinates. These equivalents are utilized to motivate a plotter which traces a rectified drawing of the input image.

3,614,411

DEFLECTION SIGNAL CORRECTION SYSTEM INCLUDING AN ANALOG MULTIPLIER

Martin C. Henderson, Canoga Park, Calif., assignor to The Bunker-Ramo Corporation, Oak Brook, Ill.

Division of Ser. No. 779,901, Nov. 29, 1968. Filed June 30, 1969, Ser. No. 870,853
Int. Cl. G06g *7/16*
U.S. Cl. 235—194 **5 Claims**



A system for correcting for inaccuracies in the positioning of a cathode-ray tube beam which inaccuracies may result from various factors including (1) curvature of the screen and (2) off-axis displacement of the electron gun. Unique analog multiplication means are disclosed for developing corrected deflection signals in response to position command signals in order to compensate for distortions which would otherwise be introduced due to the tube geometry.

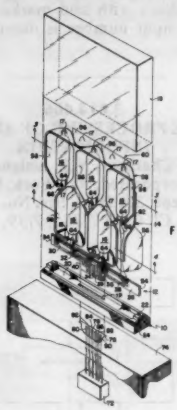
3,614,412

PHOTOFLASH LAMP ASSEMBLY

Alfred H. Bellows, Cambridge, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Mar. 17, 1969, Ser. No. 807,537
Int. Cl. G03b *15/02*
U.S. Cl. 240—1.3 **4 Claims**

A photoflash lamp assembly electrically connectable to a photoflash lamp ignition circuit includes first and second arrays of concave light reflectors arranged in nested back-to-back relationship to face in opposite directions. Each array includes at least two parallel rows of reflectors arranged in



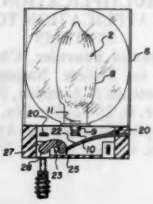
staggered interdigitated relationship. A plurality of photoflash lamps are mounted one in each of the reflectors.

3,614,413

PERCUSSION ACTIVATABLE FLASH UNITS HAVING INDIVIDUAL STRIKER ELEMENTS

David E. Beach, Rochester, N.Y., assignor to Sylvania Electric Products Inc., Danvers, Mass.

Division of Ser. No. 765,926, Oct. 8, 1968. Filed Apr. 4, 1969, Ser. No. 813,420
Int. Cl. G03b *15/02*
U.S. Cl. 240—1.3 **5 Claims**



A percussion-ignitable multilamp photoflash unit in which individual spring striker elements for each lamp of the unit are held in a preenergized condition. Access openings are provided in the base of the flash unit at positions such that an actuating mechanism in photographic apparatus on which the units are detachably mounted can cooperate to selectively release the striker elements in the flash unit.

3,614,414

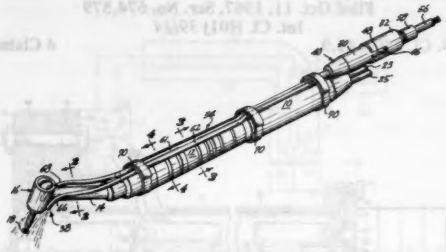
WORK AREA ILLUMINATOR

Kenneth W. Gores, Bellevue, Wash., assignor to Kirkman Laboratories, Inc., Portland, Oreg.

Filed Apr. 3, 1970, Ser. No. 26,183
Int. Cl. F21v *33/00*
U.S. Cl. 240—2 **6 Claims**

A bifurcated illuminator supplies practically shadowless light to a work area in close proximity to a working tool. From a light source remote with respect to the tool, light rays

are gathered and transmitted by fiber optic rods in bundles which extend along the tool shank and divide close to the



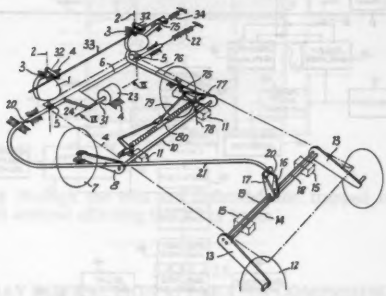
tool. The bundles are shaped near their emitting ends to emit light directed at the work area of the tool.

3,614,415
FIBER ILLUMINATOR
Alfred E. Edelman, Camden, N.J., assignor to Vicon Products Corporation, Mamaroneck, N.Y.
Filed May 19, 1969, Ser. No. 825,665
Int. Cl. F21l *1/00*
U.S. Cl. 240—2.18 **6 Claims**

A fiber illuminator especially suitable for interoral use by dentists for illuminating the interoral cavity. Light is carried along a flexible bundle of fibers from a light source to a primary light probe and the primary probe is removably connected to various instruments for directing light onto a work area during use of the instruments. The primary light probe is securely connected to an instrument by an arrangement which permits a quick disconnect and which guides the bundle of fibers away from the hand of the operator so that the instrument may be held normally.

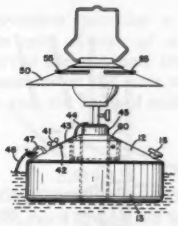
3,614,416
ROAD VEHICLE LIGHTING EQUIPMENT
Jacques Fleury, Paris, France, assignor to Societe Anonyme Automobiles Citroen, Paris, France
Filed Feb. 11, 1969, Ser. No. 798,349
Claims priority, application France, Feb. 16, 1968, 3,463
Int. Cl. B60q *1/12*
U.S. Cl. 240—8.25 **14 Claims**

Road vehicle-lighting equipment includes a linkage for pivoting the headlamp in relation to the direction of travel of the vehicle and also means responsive to vehicle roll for changing the inclination of the pivot axis of the headlamps to turn the headlamps downwardly and inwardly of a curve to compensate for the roll action. In a modified form of structure means responsive to the speed of the vehicle are



employed for changing the inclination of the pivot axis of the headlamps when the steering wheel is turned.

3,614,417
BUOYANT LANTERN SUPPORT
Clarence H. Sanford, 2055 Tulane Drive, Dayton, Ohio
Filed Aug. 11, 1969, Ser. No. 848,970
Int. Cl. F21v *31/00;* **B63b** *51/52*
U.S. Cl. 240—52 R **11 Claims**

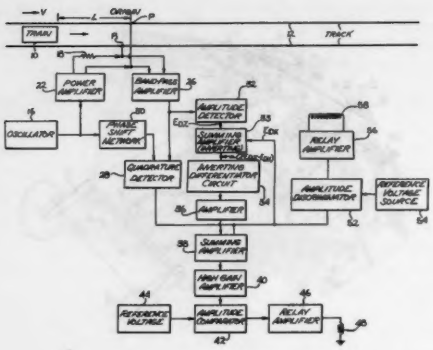


A buoyant support for portable lanterns of molded thermoplastic construction includes a lantern-receiving socket of varying cross-sectional configuration designed to permit the support to be used with lanterns having different size bases. The ballast chamber of the support is divided by a series of primary and secondary baffles to inhibit movement of the water which is used as a liquid ballast in the support.

3,614,418
RAILROAD GRADE CROSSING PROTECTION SYSTEM
Richard V. Pell, Diamond Bar, Calif., assignor to Marquardt Industrial Products Co., Cucamonga, Calif.
Filed Feb. 26, 1970, Ser. No. 14,373
Int. Cl. B61l *29/32*
U.S. Cl. 246—128 **17 Claims**

A railroad crossing warning indicator which predicts the time of arrival of trains to a grade crossing is described. Two voltages are derived from the track reactance magnitude and the impedance magnitude and are both indicative of the distance of the train. By summing the difference between the

impedance voltage and the reactance voltage with the impedance voltage, a new distance voltage is obtained



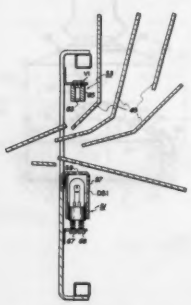
whereby errors are reduced due to the nonlinearity of the signals due to ballast resistances in the tracks.

3,614,419

MULTIPLE SHEET DETECTION SYSTEM

John W. Daughton, Fairport; James M. Donohue, Rochester, and Gary L. Schluntz, Penfield, all of N.Y., assignors to Xerox Corporation, Rochester, N.Y.

Filed Apr. 6, 1970, Ser. No. 25,766
Int. Cl. G06m 7/10
U.S. Cl. 250—223 **5 Claims**



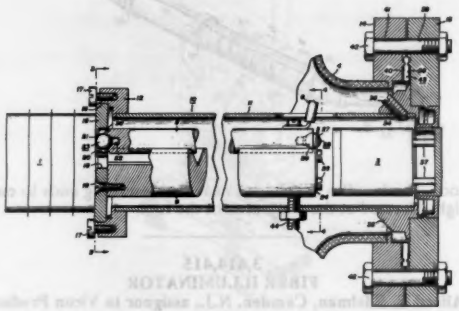
A multiple-sheet-detecting system for use in a sheet feed path to provide signals to a machine control to indicate when superposed sheets are fed past a detection station. The detection system has a light source and photosensor located on opposite sides of the sheet path such that the illumination reaching the photosensor is interrupted by the presence of a sheet or sheets in the sheet path. An electronic circuit is coupled to the photosensor which experiences a change in resistance depending upon the transmittance of a sheet or sheets in the sheet path and provides an output signal when there is a multiple sheet condition. The electronic circuit includes a motor-driven potentiometer which is utilized as a memory for a previously fed sheet in a feedback circuit for comparison with a signal representative of the next sheet. The circuit may be calibrated for varying circuit parameters to accommodate different sheet weights and types.

3,614,420

MONOPOLE MASS SPECTROMETER

Robert H. Dillenbeck, Altamont, N.Y., assignor to General Electric Company

Filed Oct. 11, 1967, Ser. No. 674,579
Int. Cl. H01j 39/34
U.S. Cl. 250—41.9 **4 Claims**



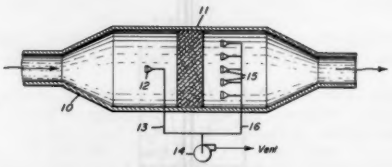
Improved electrode mounting means for a monopole mass spectrometer comprising a rigid end plate and a flexible end plate and means for rigidly supporting one of the electrodes therebetween and flexibly supporting the other.

3,614,421

AMBIENT RADIOACTIVITY AIR FILTER TESTER USING A TRACK-REGISTRATION MATERIAL

Henry Ward Alter, and Richard S. Gilbert, both of Danville, Calif., assignors to General Electric Company

Filed Dec. 12, 1968, Ser. No. 783,247
Int. Cl. G01t 1/08, 1/20
U.S. Cl. 250—43.5 **7 Claims**



An improved technique for testing air filtration systems is disclosed. So-called "absolute" filters are intended to remove substantially suspended particles from a stream of air passing therethrough. Track-registration films sensitive to alpha particles emitted by radon daughters are placed upstream and downstream of the high-efficiency filter banks. After a suitable period, the exposed films are developed. The ratio of downstream to upstream track density is a direct measure of filtering efficiency. This system is much more sensitive, convenient and simple than prior filter-efficiency-testing techniques.

3,614,422

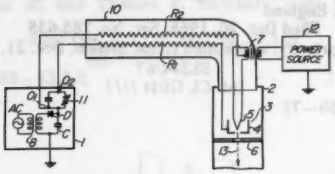
SURGE REDUCTION RESISTORS BETWEEN A HIGH-VOLTAGE SOURCE AND AN ELECTRON MICROSCOPE ELECTRON GUN

Isao Matsui, Katsuta; Yoshihisa Minamikawa, Katsuta, and Shinjiro Katagiri, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed July 28, 1970, Ser. No. 58,840
Claims priority, application Japan, Aug. 1, 1969, Nov. 10, 1969, 44/72604;44/105851
Int. Cl. H01j 37/26
U.S. Cl. 250—49.5 A **3 Claims**

A resistance for adjusting the bias voltage is provided in a high voltage source, a high DC voltage being applied to the

resistance, and the high DC voltage and bias voltage are applied to the filament and Wehnelt electrode, respectively,

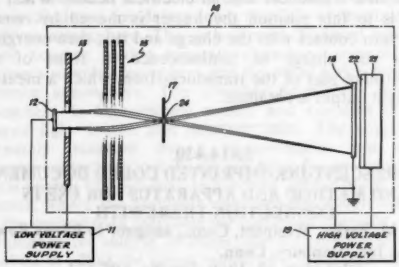


of an electron gun in an electron microscope through a high-voltage cable including two core lines whose resistance value is high enough to reduce surge voltage.

3,614,423
CHARGED PARTICLE PATTERN IMAGING AND EXPOSURE SYSTEM

Louis N. Heynick, and Eugene R. Westerberg, both of Palo Alto, Calif., assignors to Stanford Research Institute, Menlo Park, Calif.

Filed Sept. 21, 1970, Ser. No. 73,898
Int. Cl. H01j *37/12, 37/30*
U.S. Cl. 250—49.5 C **15 Claims**



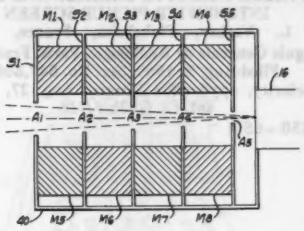
A charged-particle beam-pattern forming and imaging system is disclosed in which charged particles from one or more sources impinge upon an imaging plate. A high-voltage electrical source is connected between the imaging plate and a target to produce a strong electrical field therebetween. The imaging plate contains one or more long and narrow slits which may be straight or curved to any desired configuration. Each slit functions as a lens to yield one image of itself for each particle source, each image being converged only along the width of the slit (one-dimension convergence). Proper choices of the pattern of the particle sources and the slit arrangement in the imaging plate yield a variety of patterns useful in many applications, such as closely spaced parallel lines for diffraction gratings, interdigital patterns for microwave devices, meander lines, and interconnections for integrated circuits, by formation of the entire patterns at once rather than by the scanning or other sequential techniques used heretofore.

3,614,424
COLLIMATOR FOR AN X-RAY ANALYZER

Ian K. Openshaw, Bishops Stortford, England, assignor to Associated Electrical Industries Limited, London, England

Continuation-in-part of application Ser. No. 625,718, Mar. 24, 1967, now abandoned. This application Dec. 19, 1969, Ser. No. 886,660
Int. Cl. H01j *37/00, 35/16*
U.S. Cl. 250—49.5 PE **1 Claim**

An X-ray analyzer including a collimator having an array of screens with aligned slits and means for producing a magnetic field so that any electrons in a radiation beam

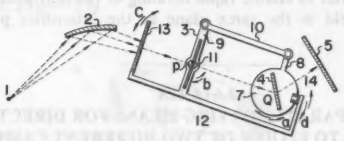


passing through the slits are deflected and trapped by the screens without affecting the X-ray beam.

3,614,425
X-RAY DIFFRACTION APPARATUS COMPRISING A CURVED SPECTROSCOPIC CRYSTAL WITH A ROTATABLE X-RAY SLIT AT THE FOCUS THEREOF

Mitsuru Yoshimatsu, Hoya, Tokyo, Japan, assignor to Rigaku Denki Company Limited, Tokyo, Japan

Filed July 23, 1969, Ser. No. 844,035
Claims priority, application Japan, Sept. 24, 1968, 43/68268
Int. Cl. G01n *23/20*
U.S. Cl. 250—51.5 **2 Claims**

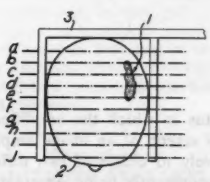


The present invention provides a microphotographic apparatus wherein only X-rays of a single wavelength separated by a curved spectroscopic crystal are allowed to fall upon a specimen and at the same time the specimen is rotated, thereby to vary the angle of incidence of said X-rays continuously.

3,614,426
HOLOGRAPHIC PROCESS

Gerald Donzelle, 109, rue d'Ermont, 95 Saint-Prix, France

Filed June 9, 1969, Ser. No. 831,497
Claims priority, application France, June 11, 1968, 154,563
Int. Cl. G01n *23/04*
U.S. Cl. 250—61.5 **4 Claims**



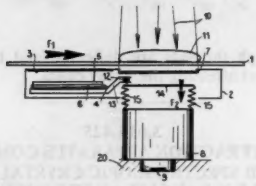
An object is located in an opaque environment permeable to radiation by recording a plurality of images of the object and these images are recorded when in the relative relationship to the parts of the object. The object or its reproduction is then displayed in conjunction with the relief image produced from the composite recording.

3,614,427

X-RAY APPARATUS HAVING COOPERATING MOVABLE CASSETTE CARRIER AND IMAGE INTENSIFIER PICKUP SCREEN

Fernand L. Vacher, Plobsheim, France, assignor to Compagnie Generale de Radiologie, Paris, France

Filed Aug. 5, 1969, Ser. No. 847,608
Claims priority, application France, Aug. 27, 1968, 164248
Int. Cl. G03b 41/16
U.S. Cl. 250—65 R 8 Claims



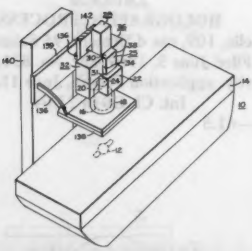
In an X-ray diagnostic apparatus comprising an X-ray image intensifier for visual (fluoroscopic) observation and a film cassette carrier for X-ray photography, the image intensifier comprises a movable pickup screen coupled to the cassette carrier to enable rapid locating of the film within the exposure field in the same plane as the intensifier pickup screen.

3,614,428

X-RAY APPARATUS HAVING MEANS FOR DIRECTING AN IMAGE TO EITHER OF TWO DIFFERENT CAMERAS

Bernard Miller, Pittsburgh, and Joseph C. McCloskey, Glenshaw, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 26, 1968, Ser. No. 762,771
Int. Cl. G03b 41/16
U.S. Cl. 250—65 4 Claims



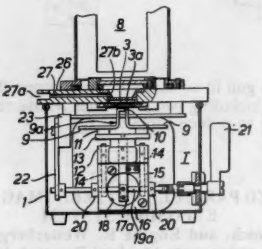
X-ray apparatus in which the amplified luminous image from the output screen of an image amplifier tube may be directed selectively to either of two different film camera locations while constantly being observable by a television camera. A rectangular housing has oppositely aligned lens-barrel-accepting openings in its top and bottom walls for television camera and image tube, respectively, and in its sidewalls for two different film cameras. A pair of normally retracted partial mirrors mounted in 45° titled attitudes are actuated horizontally about vertical axes by respective solenoids into sideward-reflecting positions near lens barrels in the wall openings.

3,614,429

EQUIPMENT FOR READING THERMOLUMINESCENT DOSIMETERS

Kenneth Edward Gordon Perry, Weymouth, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed Dec. 20, 1968, Ser. No. 785,635
Claims priority, application Great Britain, Dec. 21, 1967, 58244/67
Int. Cl. G01t 1/11
U.S. Cl. 250—71 7 Claims



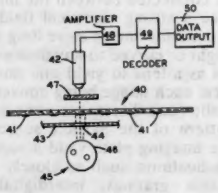
A thermoluminescent reader is described having means for introducing a charge of thermoluminescent material into a predetermined location in a lightproof casing between a photoelectric transducer and an electrical heater. When the charge is in this position the heater is moved by remote control into contact with the charge and it is then energized to heat the charge to luminescence in front of the photosensitive part of the transducer from which a measure of the light output is obtained.

3,614,430

FLUORESCENT-INK-IMPRINTED CODED DOCUMENT AND METHOD AND APPARATUS FOR USE IN CONNECTION THEREWITH

Robert M. Berler, Westport, Conn., assignor to Pitney Bowes-Alpex, Inc., Danbury, Conn.

Filed Mar. 10, 1969, Ser. No. 805,421
Int. Cl. G01n 21/38
U.S. Cl. 250—71 R 7 Claims

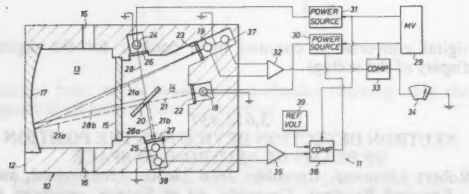


A document comprising a substantially translucent matrix or substrate upon which coded information is imprinted with fluorescent ink. This combination allows the coded document to be read similarly as a punched car or tape, i.e. by placing the source of light on one side of the document and the photoelectric sensor on the other side of the document. The generation of this kind of document, i.e. using a simple printing operation, obviates the disadvantages incurred in generating punched documents while at the same time it preserves the essential advantages inherent in the use of the latter. A simple reliable device is used to read the lighted fluorescent ink imprint through the body of the matrix.

3,614,431
MINIATURE CARBON DIOXIDE SENSOR AND METHODS

George M. Low, Deputy Administrator of the National Aeronautics and Space Administration with respect to an invention of, and Thomas F. McHenry, East Norwalk, Conn.

Filed Oct. 1, 1970, Ser. No. 77,169
Int. Cl. G01n *21/26*
U.S. Cl. 250—43.5 R 12 Claims



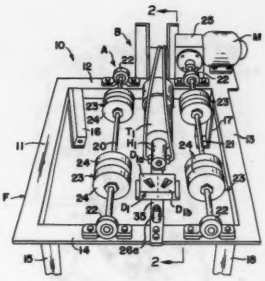
A fast response, miniature CO_2 detector with no moving parts is disclosed for determining the CO_2 concentration of any given atmosphere. The embodiment disclosed includes a sensor housing having separate chambers, one of which receives a sample atmosphere and the other which contains a reference atmosphere. The chamber having the reference atmosphere is hermetically sealed and contains separate infrared light source and detector pairs. The sources are alternately actuated by a multivibrator. An optical arrangement includes a 4.27-micron filter for one source and directs energy through first and second optical paths to each detector, where the first path traverses the sample chamber and the second path traverses the reference chamber. If CO_2 is present in the sample chamber, the 4.27-micron energy is absorbed to affect the signal output of a corresponding CO_2 detector while the 4.27-micron energy to the other reference detector is not affected. When the other source is energized, the optical arrangement directs energy from a 4.0-micron filtered source through third and fourth optical paths to each detector where the third path is equal in length to the first path and the fourth path is equal in length to the second path. The third path also traverses the sample chamber while the fourth path traverses only the reference chamber. The 4.0-micron energy is not affected by CO_2 and thus the CO_2 detector detects the energy transmitted at a 4.0-mircon wavelength as a reference value and the energy transmitted at a 4.27-micron wavelength is a measure of CO_2 concentration. The different values as detected by the CO_2 detector are supplied to a comparator circuit which provides an output to a meter calibrated to read partial pressure of the CO_2. The reference detector detects the values of light intensity from the two sources and if they are equal, an error comparator has no output. In the event the intensities are not equal, the error comparator provides a signal to a power supply for one of the light sources which adjusts the intensity until parity is obtained.

3,614,432
METHOD AND APPARATUS FOR INSPECTING PLY SPLICES OF TIRES BY MEANS OF X-RAYS

Donald T. Green, Shaker Heights, Ohio, assignor to Picker Corporation, White Plains, N.Y.

Filed Mar. 13, 1969, Ser. No. 806,860
Int. Cl. G01n *23/08*
U.S. Cl. 250—52 13 Claims

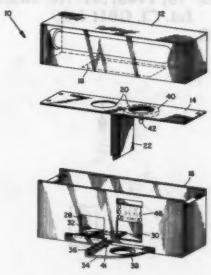
Inspection apparatus for tires wherein a tire is rotated about its axis and subjected to X-rays which are beamed through the tire wall to X-ray-detecting devices. The X-ray-detecting devices are constructed and arranged so that the tire wall is inspected to determine whether the plies in the tire are properly constructed.



3,614,433
METHOD FOR DETERMINING THE AMOUNT OF FREE WATER IN HYDROCARBONS

Donald A. Caldwell, Mountainside, N.J., assignor to Esso Research and Engineering Company

Division of Ser. No. 559,139, June 21, 1966, Pat. No. 3,500,046.
Filed Nov. 17, 1969, Ser. No. 877,125
Int. Cl. G01n *21/38*
U.S. Cl. 250—71 G 7 Claims



A method for determining the amount of water above the saturation value in a hydrocarbon liquid, such as a jet fuel, includes passing a known quantity of liquid having an unknown quantity of undissolved water through a test element having a sensitive area, which will fluoresce in the presence of ultraviolet light in proportion to the amount of undissolved water collected by the sensitive area. The test element and a standard element having a known fluorescent intensity are subjected to the ultraviolet light, whereupon the intensity of the ultraviolet light striking the surface of one of these elements is varied to match its fluorescent intensity with the reflected fluorescent intensity of the other of the elements. Thus, the intensity level of the varied fluorescent light can be correlated to a known predetermined quantity of undissolved water in the liquid.

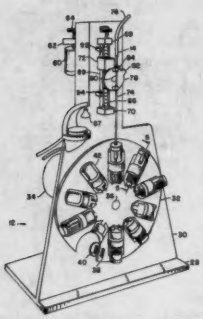
3,614,434
AUTOMATIC AGITATING AND SAMPLE DEVICE

Norman H. Horwitz, Birmingham, and Kenneth J. Cook, Oak Park, both of Mich., assignors to James E. Lofstrom, Birmingham, Mich., a part interest

Filed July 17, 1968, Ser. No. 745,451
Int. Cl. G01t *1/20*
U.S. Cl. 250—71.5 9 Claims

The disclosed apparatus includes a turntable which rotatably agitates a plurality of randomly positioned vials, each containing a liquid sample. The turntable is then

automatically indexed to receive a pipette in one of the vials after a predetermined agitation period, and the autopipettor withdraws an accurately measured liquid sample. The liquid sample may then be pumped to a further station for testing.



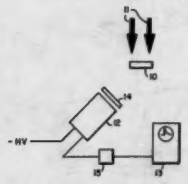
The disclosed embodiment includes a scintillation detector, counter and printing calculator adapted to measure and record the radioactivity of the sample. The apparatus is controlled by a timing and sequencing control, operably connected to each of the elements of the apparatus.

3,614,435

DOSIMETER FOR PULSED IONIZING RADIATION

Joseph J. Halpin, Alexandria, Va., and Richard F. Wenzel, Oxon Hill, Md., assignors to The United States of America as represented by the Secretary of the Navy

Filed Dec. 10, 1968, Ser. No. 782,545
Int. Cl. G01t 1/20
U.S. Cl. 250—71.5 R 1 Claim



The invention is directed to a dosimeter for pulsed beams of high-energy, ionizing radiation. The dosimeter employs the radiative recombination of radiation-induced excitation in a material. The dose is proportional to this fluorescence signal at any time. To be useful, this fluorescence should have a lifetime about an order of magnitude greater than the duration of the radiation pulse, so as to make the excitation to occur instantaneously. In addition, the material should be relatively insensitive to lattice displacement effects so that the dosimeter may be used for large cumulative doses. An example of such a material is low chromium concentration ruby single crystals (Al_2O_3:Cr), i.e. Cr concentrations 0.0003 percent to 0.001 percent by weight.

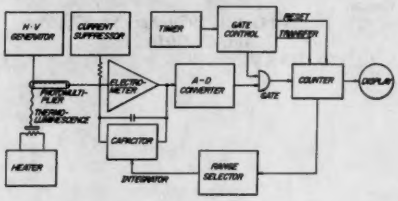
3,614,436

THERMOLUMINESCENCE DOSIMETER DEVICE

Seiro Hasegawa, Ikeda-shi, and Hiroshi Matsushima, Kadoma-shi, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma-shi, Japan

Filed Dec. 23, 1968, Ser. No. 785,919
Claims priority, application Japan, Dec. 28, 1967, Mar. 22, 1968, 43/71, 43/19280
Int. Cl. G01t 1/11
U.S. Cl. 250—71.5 9 Claims

A digital electrometer having an electrometer amplifier and a digital voltmeter for giving a digital display of a very low voltage. In the device, an analog to digital converter converts the output from the electrometer amplifier into a digital quantity and the digital output from the analog to



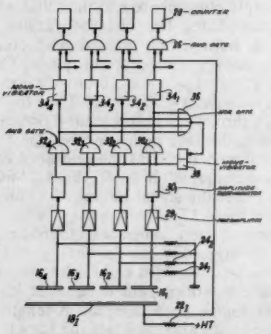
digital converter is counted by a counter for the digital display of the voltage.

3,614,437

NEUTRON DETECTION DEVICE FOR THE POSITION OF BEAMS OF NEUTRONS IN SPACE

Robert Allemand, Grenoble; Jean Jacobe, Montbonnot, and Edouard Roudaut, Grenoble, all of France, assignors to Commissariat A L'Energie Atomique, Paris, France

Filed Apr. 15, 1969, Ser. No. 816,339
Claims priority, application France, Apr. 18, 1968, 148,589
Int. Cl. G01t 3/00, 1/18
U.S. Cl. 250—83.1 8 Claims



A neutron detection device comprises a single gas-filled flat enclosure of constant thickness. A number $N \times n$ of identical disintegration ionization chambers are disposed at regular intervals in the enclosure and a cathode and an anode are carried by opposite walls. Responsive to a detection, two electrical pulses are delivered by the two electrodes of a cell and one is addressed to one of the n lines and the other to one of the N columns of a matrix-type network comprising $N \times n$ counters each associated by a line and a column of the network with only one of the cells.

3,614,438

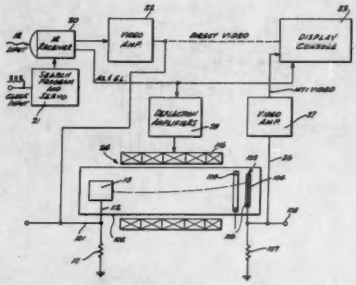
TARGET MOTION DETECTION FOR INFRARED SEARCH SYSTEMS

Gary L. Knowlden, Torrance, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed May 28, 1965, Ser. No. 459,618
Int. Cl. G01s 9/64
U.S. Cl. 250—83.3 HP 4 Claims

An infrared moving target-detecting system which may detect movement in three dimensions has an optically scanning receiver driven by servos which are controlled by a

search programming device. The received infrared signals are converted into electrical form and are processed, utilizing a storage tube, so as to activate a display showing only the signals from sources that are moving.

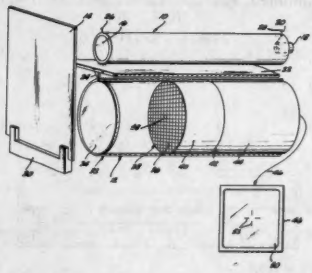


3,614,439

INFRARED ALIGNING APPARATUS AND METHOD

Victor Beelik, Jr., Van Nuys, and Jerome J. Rosenblatt, Woodland Hills, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Dec. 8, 1969, Ser. No. 882,948
Int. Cl. H01j *39/18*
U.S. Cl. 250—83.3 HP 8 Claims



A method for aligning an infrared or night sight with respect to a visible wavelength or day sight comprising holding a plane mirror in front of both sights, orienting the plane mirror so that the day sight points in a direction precisely perpendicular to the mirror, and then orienting the night sight to point perpendicular to the mirror. The night sight has a detector surface which includes a matrix of small detectors of a type which radiate infrared light of the same wavelength to which they are sensitive. The infrared sight is oriented so that light emitted from each detector, and which is reflected back by the mirror, falls on precisely the same detector which emitted it. In order to determine when the night sight is aligned, the detector matrix is constructed so there is no detector at the center of the detector surface.

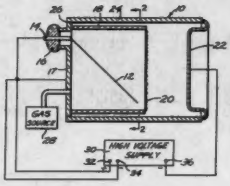
3,614,440

GAS IONIZER DEVOID OF COAXIAL ELECTRODES

Barney J. Carr, deceased, late of Colorada Springs, Colo. (by Elisabeth Helen Carr, administratrix), assignor to Kaman Sciences Corporation, Colorado Springs, Colo.

Continuation of application Ser. No. 404,535, Oct. 16, 1964. This application June 24, 1968, Ser. No. 742,960
Int. Cl. G21g *3/04*
U.S. Cl. 250—84.5 19 Claims

Apparatus for ionizing gases at very low pressures comprising inner and outer electrodes wherein the inner electrode is substantially circular in cross section and the outer electrode surrounding the inner electrode may be other than a figure of revolution or may be eccentrically positioned with respect to the inner electrode which inner electrode is less in length than two times the length of the surrounding outer electrode and is spaced therefrom a distance which is greater than the diameter of the inner electrode for a distance of not less than two-thirds the length of the surrounding outer electrode.

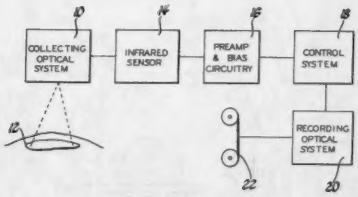


3,614,441

INFRARED RADIATION DETECTION CIRCUITRY HAVING A CONSTANT BIAS VOLTAGE ACROSS THE SENSOR

Clyde A. Boenke, Ann Arbor, Mich., assignor to The Bendix Corporation

Filed July 29, 1970, Ser. No. 62,219
Int. Cl. G01j *1/00*
U.S. Cl. 250—83.3 H 8 Claims



Electromagnetic radiation detection circuitry incorporating a sensor which is responsive to radiation in the infrared region of the electromagnetic spectrum. Variations in the detected radiation are sensed as a change in current conduction by the sensor and are strengthened by an amplifying network including an amplifying transistor. A constant bias voltage is maintained across the sensor by the action of a biasing network having a control transistor, which has its base direct coupled to the base of the amplifying transistor, and a balancing resistor, which has a resistance equal to the nominal resistance of the sensor and which in the biasing network simulates the sensor.

3,614,442

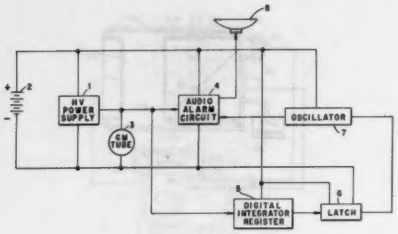
POCKET ALARM DOSIMETER

Robert S. Brodsky, 7605 New Castle Drive, Annandale, Va.

Filed Apr. 28, 1970, Ser. No. 32,677
Int. Cl. G01t *1/18*
U.S. Cl. 250—83.6 R 6 Claims

A portable pocket alarm dosimeter employs an electronic radiation counter where total dosage is accumulated in digital form in a serial counter. An alarm is provided for advance warning at a preset integrated radiation dosage. The

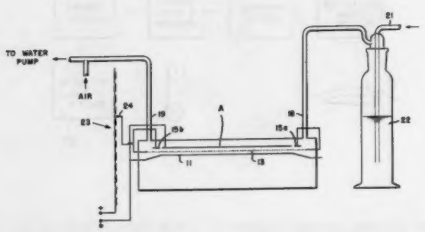
integrating device retains 100 percent of the pulses generated by the counter. The alarm levels can be readily changed to correspond to any particular application because of its extreme accuracy and its ease of adjustment.



3,614,443
SPARK CHAMBERS

Torben Hesselbo, Welwyn Garden City, and Arthur Derek George Groves, Knebworth, both of England, assignors to Smith Kline & French Laboratories, Philadelphia, Pa.

Filed Aug. 16, 1968, Ser. No. 753,088
Claims priority, application Great Britain, Sept. 6, 1967, 40832/67
Int. Cl. G01t *1/16*
U.S. Cl. 250—83.6 4 Claims



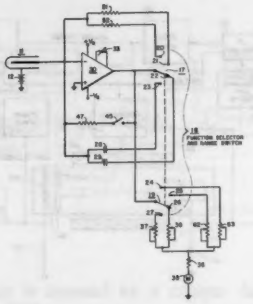
A gastight, crossed wire spark chamber having the major part of each of the walls thereof being formed from a transparent material and further having associated therewith manual or mechanical means for effecting movement of the chamber with respect to an externally mounted radioactive pattern in a plane substantially parallel to the planes of the electrodes disposed within the chamber.

3,614,444
RADIATION SURVEY METER WITH DOSE RATE AND DOSIMETER READOUT

Joseph C. Nirschl, West Long Branch, N.J., assignor to The United States of America as represented by the Secretary of the Army

Filed Nov. 21, 1968, Ser. No. 777,722
Int. Cl. G01t *1/18*
U.S. Cl. 250—83.6 R 2 Claims

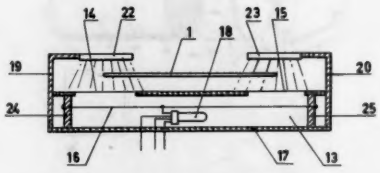
A radiation survey meter adapted to read either dose rate or dose and including a suitable operational amplifier connected to a radiation detector such as an ionization chamber and having a current meter in the output of said operational amplifier. The operational amplifier can be connected as an integrator when the current meter is to indicate dose. Alternatively, it can be connected as a current amplifier to indicate dose rate.



3,614,445
MEASURING WIDTH VARIATIONS OF A MOVING SHEET BY THE USE OF BETA-RAYS

Paul Platzek, Delft; Gerardus van Kempen, Delft, and Dominicus Ros, The Hague, all of Netherlands, assignors to Nederlandse Organisatie Voor Toegepast-Natuurweten-Schappelijk Onderzoek Ten Behoeve van Nijverheid, Handel en Verkeer, Netherlands

Continuation of application Ser. No. 643,099, June 2, 1967, now abandoned. This application Sept. 15, 1969, Ser. No. 858,200
Int. Cl. G01t *1/18*
U.S. Cl. 250—83.6 5 Claims



A device is described for measuring the variation in width of a moving sheet of material comprising two substantially identical sources of β rays positioned above the edges of the sheet and preferably one elongated ionization chamber positioned below the sheet. An electrical scheme is shown which comprises a differential amplifier.

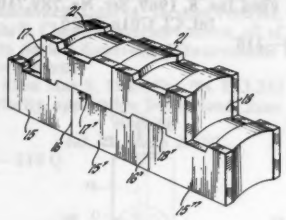
3,614,446
PROTECTIVE BRICK AGAINST RADIOACTIVE RADIATIONS

Charles Leuthold, and Francoise Leuthold, both of Avenue Ruchonnet 14, Lausanne 1000, Switzerland

Filed Oct. 10, 1967, Ser. No. 674,246
Claims priority, application Switzerland, Oct. 11, 1966, 14816/66
Int. Cl. G21f *3/04*
U.S. Cl. 250—108 6 Claims

A brick intended primarily to protect against radioactive radiations comprises two longitudinal parallel faces the surfaces of which may or may not be smooth, a front face and a rear face whose convexity and concavity are oriented vertically, and an upper and lower face whose convexity and concavity are oriented horizontally. Each of the upper and lower faces is provided with a central recess which has the same convexity and concavity as the adjacent end portions of the corresponding face. The faces other than the longitudinal faces are provided with flat edges or shoulders so that the

bricks are connected by fitting them vertically one into the other and their opaqueness is assured by their alternative

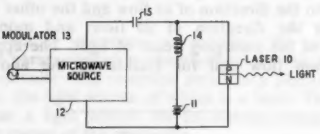


disposition with the flat shoulders and convex surfaces in abutting relationship to each other.

3,614,447
METHOD FOR MODULATING SEMICONDUCTOR LASERS

Thomas L. Paoli, Chatham, and Jose E. Ripper, North Plainfield, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 16, 1969, Ser. No. 833,522
Int. Cl. H01s *3/18*
U.S. Cl. 250—199 **7 Claims**

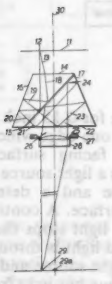


A semiconductor junction laser is modulated by applying a suitable DC voltage to produce self-induced pulsing, phase locking the pulsing repetition rate to a low-power microwave signal, and modulating the microwave signal. Information carrying capacities in excess of 10 megahertz are obtained with microwave power of a few milliwatts. Multiplexing arrangements are also described.

3,614,448
SCANNING SYSTEM FOR FOLLOWING AN OUTLINE

Kenneth Victor DiProse, and Arthur Stuart Forbes, both of Bath, Somerset, England, assignors to Hancock & Co., (Engineers) Limited, Slough, Buckinghamshire, England

Filed July 18, 1969, Ser. No. 843,051
Claims priority, application Great Britain, Feb. 21, 1969, 9429/69
Int. Cl. G05b *1/00*
U.S. Cl. 250—202 **5 Claims**

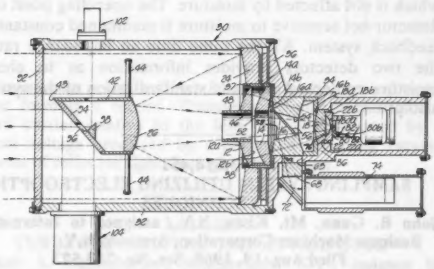


Method and apparatus for scanning an outline on a substrate in which a beam of light is passed through a semireflecting surface and thence through a rotating prism having an odd number of reflecting surfaces, the emergent beam is focused on the substrate so as to cross and recross the outline in a circular path, light reflected from the substrate is passed back along the path of the beam to the semireflecting surface and light reflected from this surface is detected to produce line-crossing signals.

3,614,449
OPTICAL TRACKING SYSTEM UTILIZING A COAXIAL LENS SYSTEM

John H. Ward, III, Valencia, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Feb. 12, 1969, Ser. No. 798,733
Int. Cl. G01c *1/00*; G02b *17/00*
U.S. Cl. 250—203 **6 Claims**



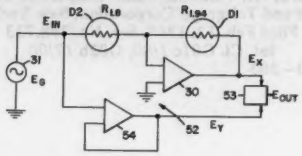
The disclosure relates to an optical system suitable for acquiring and tracking a distant source of light. The optical system contains an acquisition lens system having a first field of view formed of a plurality of centrally apertured lenses which are coaxially positioned to directly receive light rays from a source and lens means coaxially positioned behind the apertured lenses. The image surface of the acquisition lens system is coaxially positioned behind the lens means. Further, a tracking lens system having a second field of view is coaxially positioned with respect to the acquisition lens system and comprises a centrally apertured elliptical primary mirror positioned to directly receive light rays from said source. The mirror aperture is larger than the outer surface of said centrally apertured lenses. A spherical secondary mirror is positioned to receive light rays from said primary mirror and reflect the rays through said acquisition lens system aperture and through the lens means. The tracking lens system image surface is coincidental with the acquisition lens system image surface. Moreover, filter means are mounted within said acquisition lens aperture for reflecting a portion of the light source rays transmitted by the tracking lens system. The filter means may be in the form of a beamsplitter which transmits the reflected rays through the acquisition lens system onto a second image surface remote from said first image surface.

3,614,450

APPARATUS FOR MEASURING THE AMOUNT OF A SUBSTANCE THAT IS ASSOCIATED WITH A BASE MATERIAL

Robert Curtis Hill, Santa Clara; John M. French, San Jose, and Richard E. Toepfer, Campbell, all of Calif., assignors to Measurex Corporation, Santa Clara, Calif.

Filed Feb. 17, 1969, Ser. No. 799,784
Int. Cl. H01j 39/12
U.S. Cl. 250—210 5 Claims



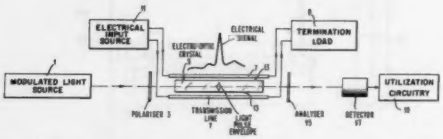
A moisture gauge for paper material includes an infrared source and two detectors one of which is responsive to a wavelength of 1.94 microns which is sensitive to moisture in the paper; the other detector is responsive to 1.8 microns which is not affected by moisture. The operating point of the detector not sensitive to moisture is maintained constant by a feedback system. AT the same time an impedance ratio of the two detectors provides information as to absolute moisture content. Automatic standardization of the system is also provided.

3,614,451

SAMPLING SYSTEM UTILIZING ELECTROOPTIC TECHNIQUES

John B. Gunn, Mt. Kisco, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 19, 1968, Ser. No. 753,523
Int. Cl. G02f 1/28, 1/18
U.S. Cl. 250—217 15 Claims



A sampling system is described which utilizes electrooptic techniques for sampling an electrical signal. Short duration light pulses are polarized and directed through a crystal exhibiting either a linear or longitudinal electrooptic effect or through a liquid showing a large Kerr effect, located in traveling wave relationship with a terminated transmission line structure. The group velocity of the polarized light, that is, the velocity of a light pulse, or the velocity, of the modulation envelope of a modulated light beam, along the electrooptic crystal and the phase velocity of the electrical signal along the transmission line structure are in synchronism. Due to electrically induced birefringence, the state of polarization of the light pulse is altered according to the electrical field intensity to which the electrooptic crystal is subjected by that portion of the electrical signal traveling coincidentally along the transmission line structure. Consequently, the transmission of the light pulse by a crossed analyzer placed at the output of the electrooptic crystal varies in response to the coincidental portion of the electrical signal. The energy of the light pulse emanating from the analyzer is detected and directed to a utilization of circuit, for example, the hold and display circuitry of a sampling oscilloscope.

3,614,452

SPLIT STREAM FLOW CELL FOR ANALYZING A FLUID

Herman R. Felton, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 8, 1969, Ser. No. 789,710
Int. Cl. G01n 21/26
U.S. Cl. 250—218 9 Claims

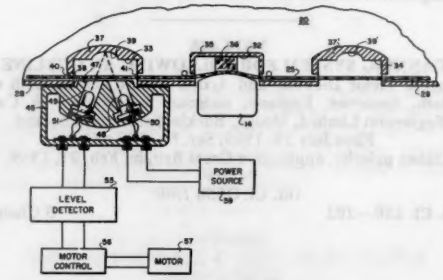
A method of analyzing a fluid, and an apparatus for accomplishing this, which comprises: splitting a stream of fluid into two substantially equal component streams; directing the flow of the component streams in opposite directions; passing a beam of light through substantially equal lengths of the two component stream in such manner that the beam traverses one component stream in a direction directly opposite to the direction of its flow and the other component stream in the direction of its flow; and monitoring the intensity of the emerging beam of light. The apparatus is a split stream flow cell for facilitating the above analysis process.

3,614,453

RADIATION SENSITIVE CASSETTE LEADER DETECTOR

Richard M. Johnson, 3815 Weeburn Drive, Dallas, Tex.

Filed Apr. 8, 1970, Ser. No. 26,557
Int. Cl. G01n 21/30
U.S. Cl. 250—219 FR 10 Claims



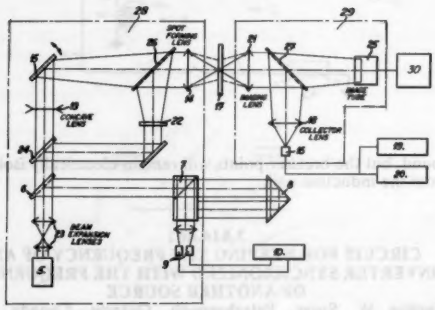
A standard cassette for 0.15 inch magnetic tape provides a tape path adjacent to one edge which passes through a recess having an outward facing surface that is reflective. A detector unit includes a light source for directing light toward the reflective surface and a detector for detecting light reflected from this surface. A control device response to the intensity of reflected light stops the tape drive. The path of directed and reflected light is through the tape which acts as a shutter. Both the light source and the detector are shielded when the tape is opaque but light from the source is reflected onto the detector when the tape is transparent. The output of the detector is a control signal indicating the character of the tape.

3,614,454

MACHINE FOR MEASURING GEOMETRICAL PARAMETERS OF A TRANSPARENCY, SUCH AS MASKS FOR INTEGRATED CIRCUITS

Maurice Koulicovitch, Geneva; Jacques Pettavel, Geneva, and Pierre Wehrli, Chene-Bougeries-Geneva, all of Switzerland, assignors to Societe Genevoise D'Instruments de Physique, Geneva, Switzerland

Filed May 9, 1969, Ser. No. 823,381
Claims priority, application Switzerland, June 17, 1968, 9042/68
Int. Cl. G01n *21/30*
U.S. Cl. 250—219 Q 9 Claims



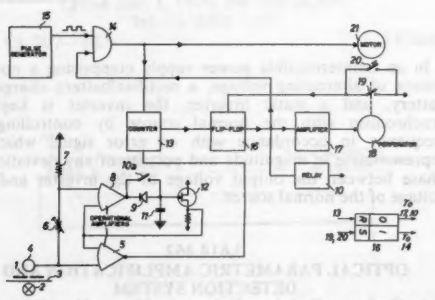
The invention concerns a machine for measuring geometrical parameters of a transparency, namely masks for integrated circuits. The machine includes a photoelectrical microscope, the light source of which is a laser. The laser is also used as a light source for an interferometer and an observation means of the apparatus.

3,614,455

FILM FRAME LOCATION DEVICE COMPRISING MEANS FOR DETECTING BOTH LEADING AND TRAILING EDGES OF FRAME

Rudolf Paulus, Munich, Germany, assignor to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Sept. 29, 1969, Ser. No. 861,775
Claims priority, application Germany, Sept. 27, 1968, P 17 97 439.9
Int. Cl. G01n *21/30*; H01j *39/12*
U.S. Cl. 250—219 22 Claims



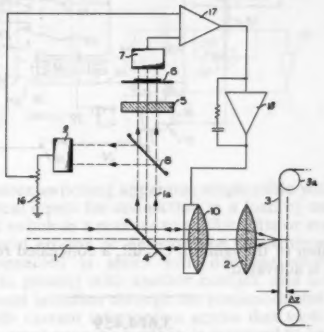
Frames in a filmstrip are separated by frame lines. The frames are centered relative to further processing means by use of first and second photoelectric measuring means, which determine, respectively, the trailing edge of a preceding frame line and the leading edge of the successive frame line. The frame is centered corresponding to the first determined edge.

3,614,456

APPARATUS FOR MAINTAINING A RECORDING RADIATION SPOT ON A RECORD CARRIER

Hansjoachim Hamisch, Berlin, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Feb. 17, 1969, Ser. No. 799,823
Claims priority, application Germany, Feb. 17, 1968, P 16 13 987.0
Int. Cl. H01j *3/14*
U.S. Cl. 250—234 15 Claims



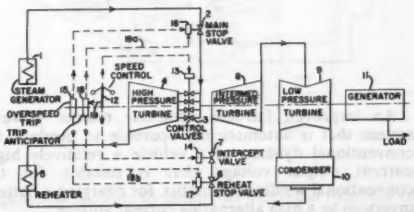
A laser beam is focused by a lens on a moving record carrier for forming a record. Transverse displacements of the record carrier relative to the lens, are compensated by a control voltage produced by a photocell receiving varying amounts of reflected light through a diaphragm.

3,614,457

TURBINE OVERSPEED TRIP ANTICIPATOR

Markus A. Eggenberger, Schenectady, N.Y., assignor to General Electric Company

Continuation-in-part of application Ser. No. 468,887, July 1, 1965, now abandoned. This application June 21, 1967, Ser. No. 666,526
Int. Cl. H02p *9/04*
U.S. Cl. 290—40 9 Claims



Turbine control system with conventional overspeed trip for stop valves and governor for control valves includes an additional trip device which temporarily closes stop valves to anticipate overspeed tripping, but reopens them to prevent permanent tripping if the governor functions to bring overspeed under control.

3,614,458

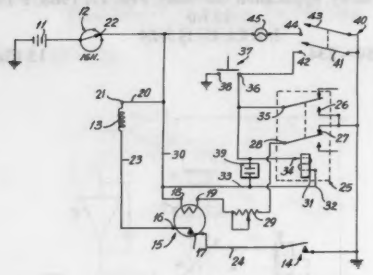
AUTOMOBILE THEFT PREVENTION DEVICE

Ira B. Stein, 924 Northfield Road, Woodmere, N.Y.

Filed Apr. 22, 1970, Ser. No. 30,850
Int. Cl. H02g *3/00*
U.S. Cl. 307—10 7 Claims

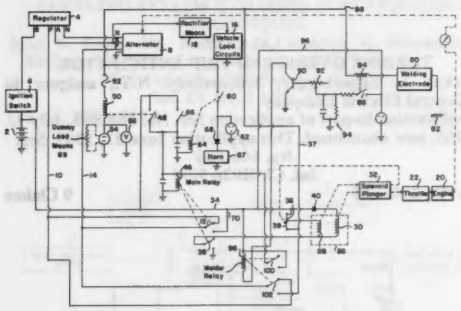
A self-activating automobile theft prevention device including a time delay relay, preferably of the thermal type.

The apparatus will interrupt the ignition circuit of an automobile unless, within a predetermined time after



activation of the ignition circuit, a concealed relay-defeating switch is activated.

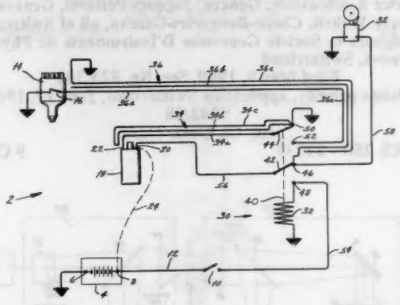
3,614,459
VEHICULAR REMOTE POWER SUPPLY SYSTEM
Fred A. Watson, 1806 North 15th st., Boise, Idaho
Filed Nov. 20, 1970, Ser. No. 91,316
Int. Cl. H02g *3/00*
U.S. Cl. 307—10 R **12 Claims**



An improved fail-safe vehicular remote power supply system that is automatically operable to produce from the conventional dynamo of a vehicle a relatively high direct current output voltage that is suitable for operating conventional welding apparatus, for charging a battery or for inversion to a high alternating current voltage.

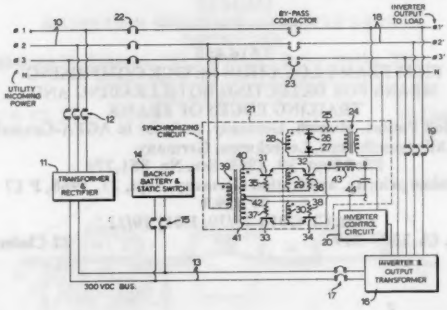
3,614,460
ANTITHEFT DEVICE
David A. Hale, 6222 Dawler St., Pine Lawn, Mo., and Earl R. Housman, 5814 Dressell Ave., St. Louis, Mo.
Filed Dec. 22, 1969, Ser. No. 887,456
Int. Cl. H02g *3/00*
U.S. Cl. 307—10 **5 Claims**

An antitheft device for an automotive vehicle includes a relay switch having contactors which are interposed in conductors extending between the ignition switch and the induction coil and between the induction coil and the breaker points. When the ignition switch is closed and the coil of the relay switch is energized, its contactors shift and complete a circuit between the battery and breaker points. On the other hand, when the ignition switch is open, the relay coil is deenergized and one of the contactors places a terminal of the induction coil in electrical connection with an alarm device so that when a jumper wire is connected between the induction coil and the battery, the alarm will



sound, but the breaker points will remain electrically isolated from the induction coil.

3,614,461
CIRCUIT FOR KEEPING THE FREQUENCY OF AN INVERTER SYNCHRONIZED WITH THE FREQUENCY OF ANOTHER SOURCE
Gordon W. Speer, Peterborough, Ontario, Canada, and Dennis F. Williamson, Media, Pa., assignors to Canadian General Electric Limited, Toronto, Ontario, Canada
Filed Feb. 2, 1970, Ser. No. 7,546
Claims priority, application Canada, Aug. 11, 1969, 59141
Int. Cl. H02j *9/00*; **H02m** *5/28*
U.S. Cl. 307—64 **8 Claims**



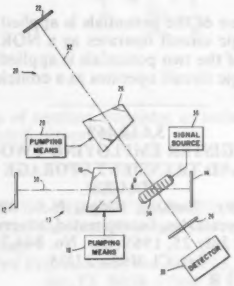
In an uninterruptible power supply comprising a normal source of alternating voltage, a rectifier/battery charger, a battery, and a static inverter, the inverter is kept in synchronism with the normal source by controlling its frequency in accordance with an error signal which is representative in magnitude and polarity of any deviation in phase between the output voltage of the inverter and the voltage of the normal source.

3,614,462
OPTICAL PARAMETRIC AMPLIFICATION AND DETECTION SYSTEM
Eric G. Lean, Ossining; Robert A. Myers, New York, and Keith S. Pennington, Somers, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Jan. 2, 1969, Ser. No. 789,095
Int. Cl. H03c *5/00*; **H01s** *3/10*
U.S. Cl. 307—88.3 **12 Claims**

A system for parametric amplification and detection of signals using an acoustic diffraction device in combination with two or more laser cavities. Two types of operation are

provided in the disclosure. In the first type of operation, two laser cavities are arranged so that the axes of the cavities intersect at a selected angle. An acoustic Bragg cell is located in the cavities at the intersection point. The two end mirrors of the first cavity are fully reflective. One mirror of the second cavity is fully reflective and the other mirror is partially reflective and partially transmissive.

The first laser cavity is operated above threshold condition and the second cavity is operated below threshold condition. When a signal having a particular frequency f is applied to the Bragg cell, part of the laser light of the first cavity is diffracted into the second cavity and raises the gain of the



cavity above the threshold condition. The second cavity then oscillates and the output of the second cavity is detected through the partially transmissive mirror.

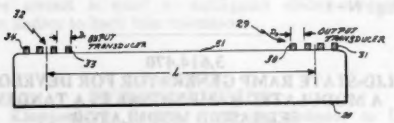
In the second type of operation, the structure is the same, however, if desired, both cavities may operate above threshold. When a signal at frequency f is applied to the Bragg cell, light is diffracted from the first cavity into the second cavity and the two cavities become coupled and oscillate only at frequencies which can be supported by the two cavities operating independently. The laser light from the output mirror therefore changes frequency indicating the detection of a signal at frequency f.

3,614,463

MICROWAVE ACOUSTIC SURFACE WAVE LIMITER AND METHOD OF FABRICATION

Andrew J. Slobodnik, Jr., Lowell, Mass., assignor to The United States of America as represented by the Secretary of the Air Force

Filed Apr. 1, 1970, Ser. No. 24,744
Int. Cl. H03f *13/00*
U.S. Cl. 307—88.3 **5 Claims**



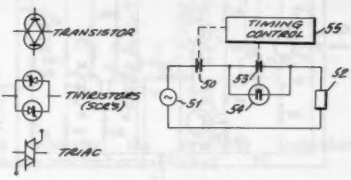
Effective limiting is achieved in a microwave acoustic surface wave device by positioning the output transducer on the acoustic wave propagation surface of a piezoelectric substrate member at a particular distance from the input transducer. Acoustic surface wave fundamental and harmonic power densities along the substrate member are measured and recorded. The output transducer is positioned at the point of maximum harmonic-fundamental interaction. Electromagnetic wave power limits are set by transducer geometry.

3,614,464

ARCLESS TAP- OR SOURCE-SWITCHING APPARATUS USING SERIES-CONNECTED SEMICONDUCTORS

Walter V. Chumakov, Huntingdon Valley, Pa., assignor to ITE Imperial Corporation, Philadelphia, Pa.

Filed Apr. 22, 1969, Ser. No. 818,216
Int. Cl. H01h *9/30*
U.S. Cl. 307—136 **11 Claims**



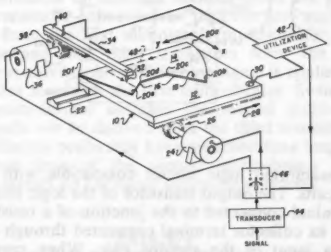
Tap- or source-switching apparatus employable with high-power electrical inputs for connection to a load by means of a mechanical switch in a manner to exhibit little or no arcing contact material erosion or deterioration. A semiconductor switch is connected in series with one current-carrying contact and in parallel with another contact, and serves to establish current initiation through the semiconductor switch and to provide current interruption across that switch. The first of said current-carrying contacts is arranged to be closed prior to the closing of the semiconductor switch and the second said contact and to remain closed until after the opening of those devices.

3,614,465

PROGRAMMABLE TIMER

Eugene W. Kenderdine, Sandia Park, N. Mex., assignor to The United States of America as represented by the United States Atomic Energy Commission

Filed Nov. 6, 1968, Ser. No. 773,835
Int. Cl. H01h *3/00*
U.S. Cl. 307—139 **10 Claims**



A programmable timer to initiate an electrical response or subsequent operation a time period after receipt of a pair of signals where the time period is dependent upon a variable function of the time interval between the signals and the time interval itself using a pair of relatively movable contact members.

3,614,466

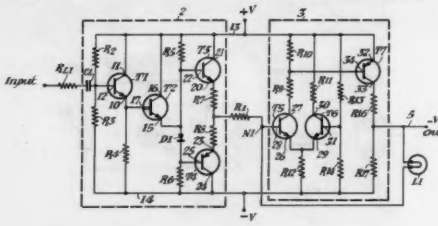
FAIL-SAFE LEVEL DETECTOR WITH 50—50 DUTY CYCLE

Reed H. Grundy, Murraysville, Pa., assignor to Westinghouse Air Brake Company, Swissvale, Pa.

Filed May 22, 1970, Ser. No. 39,801
Int. Cl. H02h *7/20;* **H03f** *17/00*
U.S. Cl. 307—202 **24 Claims**

This invention relates to a fail-safe level detector comprising an amplifier circuit having an input and an output, a feedback loop connected between the output and input for providing an upper and lower hysteresis level and a photosensitive device having a radiant-energy source

connected in the feedback loop for monitoring its condition. The photosensitive device also has a photopositive resistive element connected to the input of the amplifier circuit to assume a high-impedance condition whenever the radiant-energy source emits no radiant energy, thereby decreasing the magnitude of the input below the upper and lower

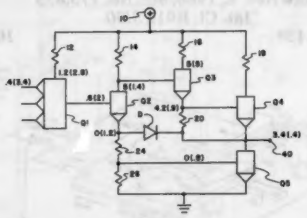


hysteresis levels so that the amplifier circuit will not produce an output during a component failure in the feedback loop. Design of the feedback loop to provide equal and opposite upper and lower hysteresis levels provides for an output having a substantially 50—50 duty cycle whenever a periodic waveform having origin symmetry has peak amplitudes exceeding the upper and lower hysteresis levels.

3,614,467
NONSATURATED LOGIC CIRCUITS COMPATIBLE WITH TTL AND DTL CIRCUITS

George K. Tu, Wappingers Falls, N.Y., assignor to Cogar Corporation, Wappingers Falls, N.Y.

Filed June 22, 1970, Ser. No. 48,200
Int. Cl. H03k *5/08, 19/36*
U.S. Cl. 307—215 **13 Claims**



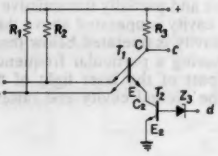
A nonsaturated logic circuit compatible with TTL and DTL circuits. The output transistor of the logic circuit has its base terminal connected to the junction of a resistor divider pair and its collector terminal connected through a diode to the drive input of the resistor pair. When current flows through the resistor divider pair to turn on the transistor, the diode conducts and the collector of the output transistor is clamped to a voltage higher than that which would otherwise be obtained in the absence of the diode. The transistor does not saturate and the transistor can then be turned off rapidly.

3,614,468
LOGIC CIRCUIT

Heinz-Wilhelm Ehlbeck, Schwaigern, and Reiner Engbert, Talheim, both of Germany, assignors to Telefunken Patentverwertungsgesellschaft m.b.H., Ulm am Danube, Germany

Filed July 15, 1968, Ser. No. 744,730
Claims priority, application Germany, July 20, 1967, P 15 37 455.7
Int. Cl. H03k *19/34*
U.S. Cl. 307—215 **9 Claims**

A logic circuit having a transistor with several input electrodes for controlling the transistor and at least one output connected to the collector of the transistor. An electrode connected to the transistor serves as its emitter electrode when the logic circuit is operated as a NOR-gate. Further, means are connected to the emitter electrode to provide for selectively applying two different potentials

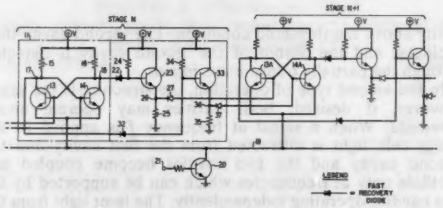


thereto. When one of the potentials is applied to the emitter electrode the logic circuit operates as a NOR-gate, whereas when the other of the two potentials is applied to the emitter electrode, the logic circuit operates as a coincidence-gate.

3,614,469
SHIFT REGISTER EMPLOYING TWO-PHASE COUPLING AND TRANSIENT STORAGE BETWEEN STAGES

John D. Heightley, Basking Ridge, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 25, 1969, Ser. No. 844,752
Int. Cl. H03k *23/08*
U.S. Cl. 307—221 R **12 Claims**



In shift registers there is generally provided an intermediate storage function between stages to enable each stage to transfer its information prior to accepting the next incoming signal, i.e., to avoid a race condition. In accordance with this invention there is provided between each stage a coupling circuit comprising in series a Schottky-barrier (SB) diode, an emitter-follower transistor, and a second diode. While the stages are in the holding mode, the state of stage N is coupled through the SB diode, stored on the capacitance at the base of the emitter-follower, and isolated from stage N+1 by the second diode. Upon application of a shift signal, the SB diode immediately turns off and thereby isolates the Nth stage from the emitter-follower. The second diode turns on; and the signal which was stored at the base of the emitter-follower is coupled through the second diode to set the state of stage N+1.

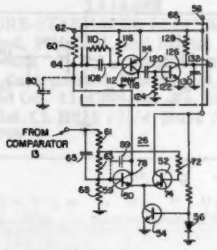
3,614,470
SOLID-STATE RAMP GENERATOR FOR DEVELOPING A MODULATED RAMP SIGNAL IN A TANDEM SERRASOID MODULATOR

Ross E. Ruthenberg, Des Plaines, and James C. Evitts, Jr., Schaumburg, both of Ill., assignors to Motorola Inc., Franklin Park, Ill.

Filed Apr. 23, 1970, Ser. No. 31,277
Int. Cl. H03k *4/08*
U.S. Cl. 307—228 **5 Claims**

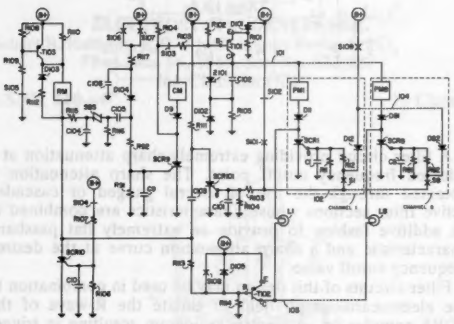
A serrasoid phase modulator includes tandem modulation stages having a ramp generator with a linearizing circuit. In the ramp generator, an unwanted current pulse is transferred through the base-to-collector junction capacitance of a transistor. A capacitor across which the ramp signal developes is coupled to the collector of the same transistor. To prevent the ramp signal from being distorted by the

current pulse, the ramp linearizing circuit is connected between the collector and the capacitor and utilizes the base-



to-emitter drop of another transistor to isolate the capacitor from the unwanted current pulse.

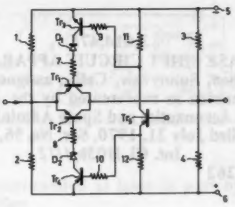
3,614,471
KEYBOARD CONTROL CIRCUIT
Hugh St. Lawrence Dannatt, Rochester, N.Y., assignor to The Singer Company
Filed Feb. 3, 1969, Ser. No. 795,788
Int. Cl. H03k *17/00*
U.S. Cl. 307—241 13 Claims



Controlled avalanche devices such as silicon-controlled rectifiers are used to maximum advantage so that there are dual control paths through the device, one of which may represent a relatively short term function and the other of which may be a relatively long term function, such as, a memory circuit. The inductive EMF of an interrupted inductive circuit is used to extinguish silicon-controlled rectifiers and/or to back bias transistors.

3,614,472
SWITCHING DEVICE
Nico J. Kloppenborg, Seaton, Australia, assignor to U.S. Philips Corporation, New York, N.Y.
Filed June 3, 1969, Ser. No. 829,920
Claims priority, application Australia, June 17, 1968, 39268
Int. Cl. H03k *17/60*
U.S. Cl. 307—255 7 Claims

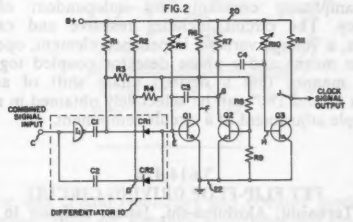
A switching circuit comprising a resistance bridge and a signal transmission path including a pair of switching transistors of opposite conductivity connected in parallel across one diagonal of the bridge to form complementary signal paths. A source of DC voltage is connected to the other diagonal of the bridge. The base electrodes of the switching transistors are connected to opposite terminals of the DC source, each via a diode and a base-keying transistor in series. A common control transistor provides a means for simultaneously blocking and unblocking the base-keying



transistors whereby the switching transistors are simultaneously blocked or unblocked.

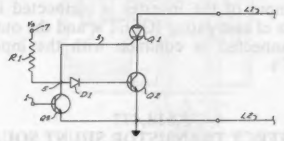
3,614,473
IMPROVED CIRCUIT FOR PROVIDING TWO MONOSTABLE MULTIVIBRATORS
Donald S. Lindsay, and William J. Little, both of Lynchburg, Va., assignors to General Electric Company
Filed Sept. 15, 1969, Ser. No. 857,794
Int. Cl. H03k *3/284*
U.S. Cl. 307—273 1 Claim

FIG. 2



Two monostable or one-shot multivibrators are provided by three transistors connected so that the first and second transistors form the first monostable multivibrator, and so that the second and third transistors form the second monostable multivibrator. A switching signal is applied to the first transistor to switch the first multivibrator. Switching of the first multivibrator switches the second multivibrator. Output signals can be derived from the third transistor. The first multivibrator preferably has a switched time longer than the switched time of the second multivibrator so that extraneous signals do not cause undesired switching.

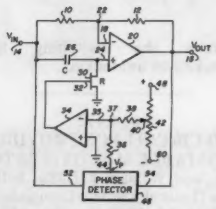
3,614,474
SEMICONDUCTOR POWER-SWITCHING APPARATUS
Larry Alan Hahn, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.
Filed Oct. 24, 1968, Ser. No. 770,259
Int. Cl. H03k *17/00*
U.S. Cl. 307—252 C 16 Claims



Apparatus is disclosed for semiconductor switching of relatively high-current, high-voltage power loads. An SCR is connected serially with a transistor for switching of a power circuit. Control circuitry is provided for switching on the circuit by triggering the SCR and turning on the transistor.

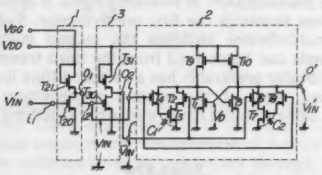
Turnoff of the SCR for switching off the circuit is accomplished by turning off the transistor and providing a shunt path through the gate of the SCR for momentarily shunting the load current around the transistor.

3,614,475
PHASE SHIFT CIRCUIT APPARATUS
Gordon J. Deboo, Sunnyvale, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration
Filed July 21, 1970, Ser. No. 56,791
Int. Cl. H03k *1/12*
U.S. Cl. 307—262 **9 Claims**



A phase shifting circuit for selectively shifting the phase of an input signal from 0° to 180°, the circuit maintaining the signal amplitude constant and independent of signal frequency. The circuit includes resistive and capacitive elements, a voltage variable impedance element, operational amplifier means and a phase detector coupled together in such a manner that a desired phase shift of anywhere between 0° and 180° can be selectively obtained in response to a simple adjustment of a circuit component.

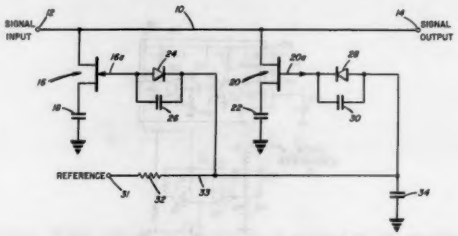
3,614,476
FET FLIP-FLOP DRIVING CIRCUIT
Yuichi Teranishi, Akishima-shi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan
Filed Nov. 4, 1968, Ser. No. 772,912
Claims priority, application Japan, Nov. 6, 1967, 42/70973
Int. Cl. H03k *3/286*
U.S. Cl. 307—279 **16 Claims**



A driving circuit for driving a flip-flop comprising a pair of trigger circuits, each of which is composed of a gating insulated gate field effect transistor (referred to as IGFET hereinafter), memorizing IGFET and triggering one, said driving circuit comprising an inverter constituted by connecting first and second IGFET in series with each other, wherein the input of the inverter is connected in common with the inputs of said gating IGFET's, and the output of said inverter is connected in common with the inputs of said trigger IGFET's.

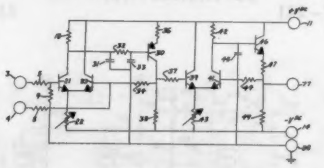
3,614,477
FIELD EFFECT TRANSISTOR SHUNT SQUARING NETWORK
Henry F. Liebman, Plantation, Fla., assignor to The Bendix Corporation
Filed Nov. 26, 1968, Ser. No. 779,113
Int. Cl. H03k *3/26*
U.S. Cl. 307—279 **9 Claims**

A squaring network wherein an input signal wave appearing on a signal line and having a peak value occurring at a repetition frequency equal to a pulse repetition frequency of a reference square wave is shaped into a square



wave. A pair of oppositely poled field effect transistors shunt the signal line alternately to one and then another signal storage capacitor in response to the reference square wave.

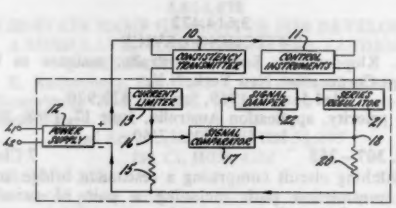
3,614,478
HIGHLY SELECTIVE FILTER CIRCUIT
Peter Schiff, R. D. #2, Lambertville, N.J.
Filed July 30, 1969, Ser. No. 845,998
Int. Cl. H03k *1/16*; H03f *3/68*; H03k *3/72*
U.S. Cl. 307—295 **12 Claims**



A filter circuit providing extremely sharp attenuation at a selected frequency cutoff point. The sharp attenuation is obtained through the use of several ganged or cascaded active filter sections whose characteristics are combined in an additive fashion to provide an extremely flat passband characteristic and a sharp attenuation curve at the desired frequency cutoff value.

Filter circuits of this design may be used in combination in the electrocardiograph field to isolate the R-wave of the PQRS complex of an electrocardiogram resulting in trigger signals of a high degree of accuracy for purposes of R-wave detection and evaluation.

3,614,479
POWER SUPPLY AND SIGNAL CONDITIONER FOR ELECTRONER FOR ELECTRONIC INSTRUMENTATION
David E. Nelson, St. Cloud, Minn., assignor to DeZurik Corporation, Sartell, Minn.
Filed July 18, 1969, Ser. No. 843,160
Int. Cl. H03k *1/14*
U.S. Cl. 307—297 **8 Claims**



An electronic signal conditioner for use with process control instruments is described in which a signal from a transmitting instrument is received and conditioned by way of damping and current limiting before being retransmitted

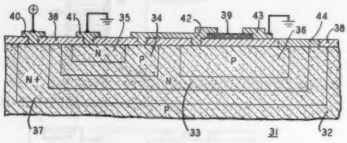
to control apparatus. The output signal is essentially independent of the internal impedance of the receiving apparatus.

3,614,480

TEMPERATURE-STABILIZED ELECTRONIC DEVICES

Carl N. Berglund, Plainfield, and Martin P. Lepselter, New Providence, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 13, 1969, Ser. No. 865,747
Int. Cl. H03k *17/14*; H05k *1/00*
U.S. Cl. 307—299 **12 Claims**



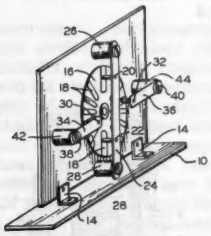
Vanadium oxide exhibits a substantial and relatively abrupt change in conductivity as the temperature of the material is varied through a particular characteristic temperature (about 68° C.). In accordance with our invention, a vanadium oxide resistor is employed as a temperature-sensing element in the control circuit of a heater to stabilize the operating temperature of an electronic circuit at about 68° C. over a wide range of ambient temperatures.

3,614,481

ELECTROSTATIC GENERATOR

Robert B. Halliday, R.D. #1, Chenango Forks, N.Y.

Filed June 16, 1969, Ser. No. 833,289
Int. Cl. H02n *1/00*
U.S. Cl. 310—6 **10 Claims**



A device for collecting a charge of static electricity by rotating a disc or wheel carrying a plurality of individual conductors in proximity to a pair of stationary conductors. Four stationary brushes are arranged in two pairs to wipe the charge from the individual conductors which is initially induced by the natural imbalance in static charge between the stationary and moving conductors. The charges from each pair of brushes are returned to the stationary conductors and stored on an appropriate capacitor.

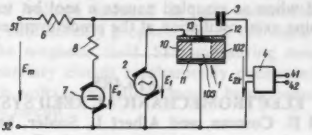
3,614,482

DC VOLTAGE INVERTER

Antonin Glanc, Libochovice, and Vaclav Janovec, Praha, both of Czechoslovakia, assignors to Ceskoslovenska akademie ved, Praha, Czechoslovakia

Filed Jan. 20, 1970, Ser. No. 4,288
Int. Cl. H01v *7/00*
U.S. Cl. 310—8.1 **14 Claims**

A capacitor operating at a temperature-autostabilized state, having a pair of exciting electrodes and a ferroelectric dielectric arranged therebetween. An AC generator is connected between the paired electrodes. The capacitor has output electrodes arranged in association with the first paired



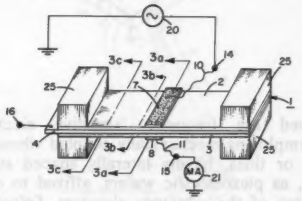
electrodes, and surrounded at least in part by one of them and an AC amplifier.

3,614,483

WIDTH FLEXURAL RESONATOR AND COUPLED MODE FILTER

Don A. Berlincourt, Chagrin Falls, Ohio, assignor to Clevite Corporation

Filed June 24, 1970, Ser. No. 49,497
Int. Cl. H01v *7/00*
U.S. Cl. 310—8.1 **26 Claims**



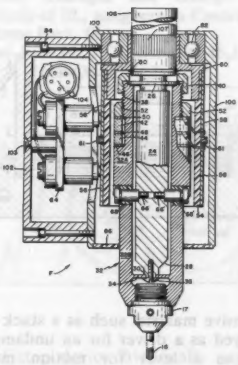
Ceramic and crystal resonators and coupled mode filters are disclosed. They are platelike assemblies and operate in the width flexural mode. The operating frequency is determined primarily by the width and thickness of the assembly.

3,614,484

ULTRASONIC MOTION ADAPTER FOR A MACHINE TOOL

Andrew Shoh, Ridgefield, Conn., assignor to Branson Instruments, Incorporated, Stamford, Conn.

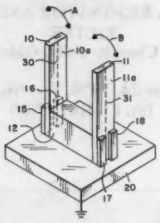
Filed Mar. 25, 1970, Ser. No. 22,413
Int. Cl. H01v *7/00*; H04r *17/00*
U.S. Cl. 310—8.2 **6 Claims**



An ultrasonic motion adapter for a machine tool comprises two elongated coaxially disposed members coupled to each

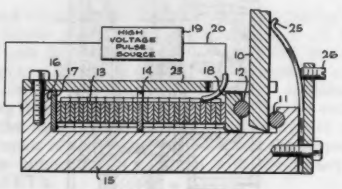
other with one of the members being adapted to oscillate as a half wavelength resonator at a predetermined frequency, typically at an ultrasonic frequency of 20 kHz. The adapter is designed to be removably coupled to a conventional machine tool and when so coupled causes a tool bit to rotate while undergoing axial oscillation at the predetermined frequency.

3,614,485
ELECTROMECHANICAL REED SYSTEM
Armond D. Cosman, and Albert L. Snider, both of Austin, Tex., assignors to Austron, Inc., Austin, Tex.
Filed Aug. 5, 1969, Ser. No. 847,687
Int. Cl. H01v 7/00
U.S. Cl. 310—8.2 **8 Claims**

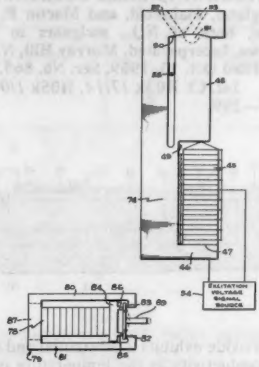


Disclosed are frequency sensitive electromechanical systems employing mechanically coupled vibratory elements, as reeds or tines, having laterally spaced strain sensitive elements, as piezoelectric wafers, affixed to corresponding major faces of the vibratory elements. Select ones of the piezoelectric wafers are electrically interconnected to eliminate erroneous output signals due to external shocks to the system from any direction. Input and/or output means are coupled to selected interconnected wafers for respectively applying and picking off input and output signals to and from the vibratory elements having a frequency in the vicinity of the mechanical resonant frequency of the system.

3,614,486
LEVER MOTION MULTIPLIER DRIVEN BY ELECTROEXPANSIVE MATERIAL
Parker C. Smiley, Oakland, Calif., assignor to Physics International Company, San Leandro, Calif.
Filed Nov. 10, 1969, Ser. No. 875,019
Int. Cl. H01v 7/00, 9/00
U.S. Cl. 310—8.2 **6 Claims**

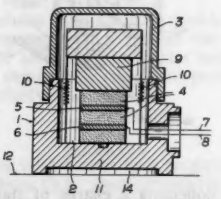


Electroexpansive material such as a stack of piezoelectric discs is employed as a driver for an undamped spring-mass system, such as a lever for motion multiplication. A displacement, step or other motion, is obtained without residual motion by controlling the voltage excitation time, such as the period of a square wave voltage pulse to the natural period of the system or the period of the ramp of a step voltage to the natural period of the system. A high-speed printer exemplifies application of such controlled excitation



and the advantage of controlling the pulse period. Various forms are disclosed for the lever.

3,614,487
PIEZOELECTRIC ACCELEROMETER WITH BASEPLATE COOLING
Rudolf A. Hatschek, Fribourg, Switzerland, assignor to Vibro-Meter AG, Fribourg, Moncor, Switzerland
Filed Oct. 4, 1968, Ser. No. 765,164
Claims priority, application Austria, Oct. 10, 1967, A 9167/67
Int. Cl. H01v 7/00
U.S. Cl. 310—8.4 **6 Claims**

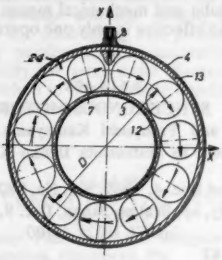


A transducer, in particular a piezoelectric transducer for accelerometry, wherein the measuring elements are located in a housing comprising a bottom by means of which it is mounted on the object to be measured, at least one outwardly open recess being provided in the bottom.

3,614,488
MULTICOMPONENT FORCE TRANSDUCER
Hans Conrad Sonderegger, Neftenbach, and Gelli Spescha, Winterthur, both of Switzerland, assignors to Ristler Instruments A. G., Winterthur, Switzerland
Filed July 30, 1969, Ser. No. 846,018
Claims priority, application Switzerland, July 30, 1968, 11446/68
Int. Cl. H01v 7/00
U.S. Cl. 310—8.6 **13 Claims**

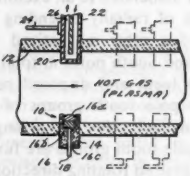
A piezotransducer device in which several piezoplates are

located between force-transmitting members and are



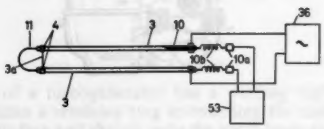
oriented with the force-sensitive axes depending on the type of force to be measured thereby.

3,614,489
LIQUID ELECTRODE
Carl A. Jensen, 920 Fordham, Davis, Calif., and Lowell L. Wood, Jr., 2844 Royal Ave., Simi, Calif.
Filed Jan. 11, 1968, Ser. No. 697,078
Int. Cl. H02n 4/02
U.S. Cl. 310—11 18 Claims



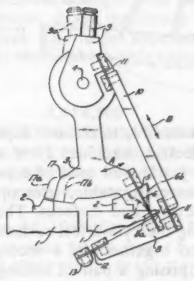
Improved electrode performance in a magnetohydrodynamic device is obtained with an electrode structure which includes a liquid (molten) portion in electrical contact with the electrically conductive gas stream. The liquid is highly electrically conductive and, when employed as a cathode, it has excellent electron emission characteristics at and These presently employed practical operating temperatures in MHD devices. Tese properties are retained during continuous operation over long periods of time. If both cathode and anode are liquid they may be held in place by rotating the gas flow channel, which supports the electrodes, about its longitudinal axis.

3,614,490
MEANS FOR MEASURING THE SQUARE OF THE STRENGTH OF A MAGNETIC FIELD
Sven Gunnar Soredal, Stockholm, Sweden, assignor to LKB-Produkter Aktiebolag, Mariehall, Sweden
Filed Dec. 23, 1969, Ser. No. 887,547
Claims priority, application Sweden, Dec. 27, 1968, 17821/68
Int. Cl. H02k 35/04
U.S. Cl. 310—25 16 Claims



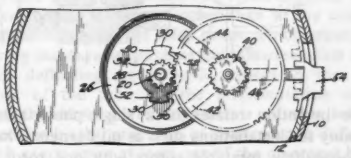
A device for measuring the square of the strength of a magnetic field is disclosed. The device is particularly operable to measure mass numbers. A number of mechanically oscillating resiliently suspended conductors (primary circuit) connected to an alternating current source are arranged in said magnetic field. Means are provided for measuring the voltage induced in said conductors, said voltage being substantially proportional to the square of the strength of the magnetic field. Said measuring means may include a secondary circuit mechanically connected to the primary circuit, voltage measuring means being connected to said secondary circuit.

3,614,491
ELECTRICALLY OPERATED MOTION CONVERSION MEANS
Otto Anna, Niederhochstadt; Jochen Kassner, Kronberg, and Bernhard Druen, Schwalbach, all of Germany, assignors to Braun Aktiengesellschaft, Frankfurt/Main, Germany
Filed June 3, 1970, Ser. No. 43,133
Claims priority, application Luxembourg, June 27, 1969, 58,982
Int. Cl. H02k 7/06
U.S. Cl. 310—37 9 Claims



An electric motor has an oscillating armature which performs in a predetermined time interval a first number of oscillations corresponding to the cycles of an alternating current supplied to it. An oscillatory output member is arranged to be driven by the motor. Mechanical means cooperates with the armature and the output member and imparts to the latter in the aforementioned time interval a second number of oscillations which is double the first number.

3,614,492
BIDIRECTIONAL MOTOR
Kenji Yatsushiro, Chicago, and George F. Kuchuris, Westchester, both of Ill., assignors to Controls Company of America, Melrose Park, Ill.
Filed June 10, 1970, Ser. No. 45,118
Int. Cl. H02k 7/118
U.S. Cl. 310—41 2 Claims



The Y-shaped stop device frictionally engages the gear shaft and tends to rotate with the gear. The freedom of movement of the device is restricted by the selector to permit a selected arm of the Y to be effective. If the pinion gear starts in the wrong direction, the stop wing carried by the

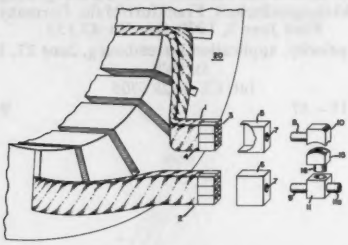
rotor will strike the effective arm which has been frictionally rotated into a position which insures optimum starting conditions for rotation in the desired direction. Upon engagement the rotor starts in the desired direction and the friction acting on the stop device moves the arm clear of the path of the stop wings. The selector limits movement of the stop device to keep the other arm clear of the stop wings.

3,614,493

UNIVERSAL LIQUID-COOLED CONNECTION ASSEMBLY

Harold E. Collings, Schenectady, and William L. Darby, Scotia, both of N.Y., assignors to General Electric Company

Filed Jan. 29, 1970, Ser. No. 6,902
Int. Cl. H02k 9/00
U.S. Cl. 310—54 **7 Claims**



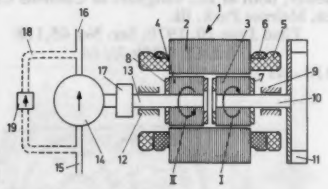
A connector assembly to connect liquid-cooled stator bars in a dynamoelectric machine. First and second headers attached to the juxtaposed ends of a pair of stator bars are jointed by means of rotatable, telescoping joints to fittings having mating cylindrical surfaces. The fittings are further aligned by sliding the cylindrical surfaces upon one another, and then brazed together. In a second embodiment, two joints each comprising a pair of mating cylindrical surfaces generated about perpendicular axes provide an additional degree of freedom between the fittings to compensate for restricted movement at one of the rotatable telescoping joints in certain header orientations.

3,614,494

SINGLE-PHASE ELECTRIC MOTOR

Alwin Borchers, Flensburg, Germany; Kyrre Guttorm Sjotun, Norge; Gunnar Lysboj Hansen, Nordborg, and Jorgen Rono Clausen, Langeso pr. Nordborg, Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Filed May 18, 1970, Ser. No. 38,322
Claims priority, application Germany, May 17, 1969, P 19 25 305.5
Int. Cl. H02k 17/00
U.S. Cl. 310—126 **2 Claims**



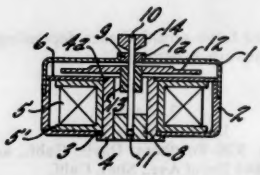
The invention relates to a single-phase electric motor assembly for installations such as oil burners. The motor has two oppositely rotatable rotors with one rotor adapted to drive a blower and the other adapted to drive an oil pump. The stator has main and secondary windings offset from each other which are switchable on and off together. The current phase in the secondary winding leads by up to 20° upon startup and remains above 0° at the highest operating voltage. There is a time lag during which the blower rotor builds up speed and it is only thereafter that its rotary field acts on the pump rotor to drive it in the opposite direction. Alternate hydraulic and mechanical means are provided for making the pump effective in only one operating direction.

3,614,495

SYNCHRONOUS MOTOR

Yasuo Suzuki, and Yasuyoshi Kameyama, both of Osaka, Japan, assignors to Matsushita Denko Kabrishiki Kaisha, Osaka, Japan

Filed Dec. 4, 1969, Ser. No. 882,018
Claims priority, application Japan, Dec. 9, 1968, 43/9065
Int. Cl. H02k 19/00
U.S. Cl. 310—162 **6 Claims**



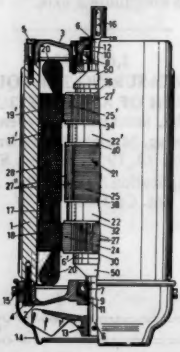
A fixed-directional self-starting synchronous motor comprising a stator associated to an exciting coil therefor and having two groups of radially extending pole teeth of the same number, and a rotor magnetized to have the same number of North and South poles in total with total number of the stator pole teeth and disposed rotatably above the stator. Respective pole tooth groups of the stator are of different width from each other and arranged alternately one by one. The two pole tooth groups are further deviated by a desired angle in a desired rotating direction of the rotor from the position of the case in which the groups are arranged at a regular interval, respectively.

3,614,496

SYNCHRONOUS ELECTRIC MOTOR

Lodewijk Schiethart, Dubbeldam, Netherlands, assignor to N.V. Electromotorenfabriek Dordt, Dordrecht, Netherlands

Filed Jan. 12, 1970, Ser. No. 2,195
Claims priority, application Netherlands, Jan. 17, 1969, 69.00864
Int. Cl. H02k 19/00
U.S. Cl. 310—162 **6 Claims**



The rotor of a synchronous electric motor includes an enlarged shaft portion of magnetic material upon which a pair of squirrel cage winding and pole piece assemblies are mounted in spaced relation with a spacer ring of magnetic

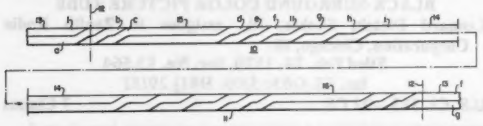
material disposed between the assemblies. The laminations of the pole pieces are sandwiched between the end plates of the squirrel cage windings and the radially projecting poles receive some of the conducting bars joining the end plates. The main body portions of the laminations are annular, having substantially the same outer diameter as the spacer ring, and are notched to receive those conducting bars which do not pass through the poles.

3,614,497

TRANSPOSED CONDUCTOR FOR DYNAMOELECTRIC MACHINES

William C. Brenner, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 25, 1970, Ser. No. 22,474
Int. Cl. H02k *3/14*
U.S. Cl. 310—213 10 Claims



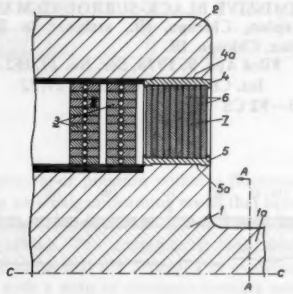
A transposed stranded conductor for dynamoelectric machines in which the transposition is incomplete in the slot portion of the conductor so that unbalanced strand voltages occur which are made to balance the strand voltages occurring in the end portions of the conductor. In the preferred embodiments, this result is accomplished by providing untransposed sections in the slot portion of the conductor.

3,614,498

WINDING COIL SUPPORT MEANS

Henning Bank; Per-Owe Jilsen; Hans Klein, and Tage Persson, all of Vasteras, Sweden, assignor to Allmanna Svenska Elktriska Aktiebolaget, Vasteras, Sweden

Filed Nov. 16, 1970, Ser. No. 89,610
Int. Cl. H02k *3/50*
U.S. Cl. 310—262 6 Claims



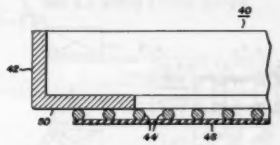
A rotor of a turbogenerator has a winding coil support which includes a retaining ring surrounding the coil ends of the rotor winding and shrunk onto the rotor body and onto a support ring arranged in the rotor body axially outside the coil ends. The support ring is formed by at least four coaxial metal rings arranged axially one after the other and radially gripped by the rotor body and the retaining ring.

3,614,499

TARGET STRUCTURE FOR CAMERA TUBES CONSISTING OF A MAGNESIUM OXIDE LAYER SUPPORTED ON ONE SIDE OF A METAL MESH

William C. Deits, North Syracuse, and Bernard E. Day, Liverpool, both of N.Y., assignors to General Electric Company

Filed May 1, 1969, Ser. No. 820,781
Int. Cl. H01j *29/45, 31/30*
U.S. Cl. 313—65 4 Claims



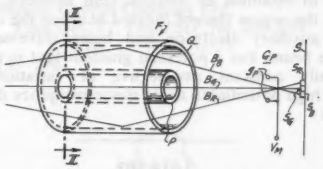
A target structure is disclosed having superior electrical properties and mechanical strength. The target comprises a homogenous magnesium oxide membrane supported by a fine gauge nickel mesh. The target structure can be used in either direct-beam or return-beam-type camera tubes.

3,614,500

MISCONVERGENCE COMPENSATION FOR SINGLE-GUN, PLURAL-BEAM-TYPE COLOR TV PICTURE TUBE

Senri Miyaoka, Kanagawa-ken, and Minoru Morio, Tokyo, both of Japan, assignors to Sony Corporation, Shinagawa-ku, Tokyo, Japan

Filed Apr. 14, 1969, Ser. No. 815,870
Claims priority, application Japan, Apr. 14, 1968, 43/24897
Int. Cl. H01j *29/02, 31/20, 29/74*
U.S. Cl. 313—69 C 4 Claims

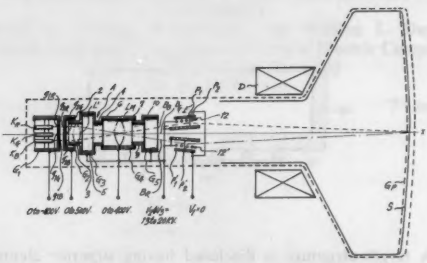


A single-gun, plural-beam-type color television picture tube in which three electron beams representing different color signals are focused by a single lens, after which two of the beams diverge. The two divergent beams are reconverge by convergence deflecting means so they will intersect with the third beam at a common point at a beam-selecting grid, from which point the beams again diverge to impinge on respective color phosphors which together represent a color picture element. Misconvergence, i.e., reconvergence of the two divergent beams to a point other than to the common point of intersection with the third beam, which arises from manufacturing inaccuracies such as the misorientation of the convergence deflecting means with respect to the single electron gun of the tube, or the misorientation of the aperture of the beam-generating means of the tube, is compensated for by the provision of convergence deflecting means which exerts upon at least one of the divergent beams an electric, or Coulomb, force which varies in its direction in accordance with the position at which the beam enters and passes through the convergence deflecting means. Thereby, variations in the direction of the electric force compensates for variations in the position at which the beam is introduced to eliminate the misconvergence which arises from the above-mentioned manufacturing inaccuracies.

3,614,501
BEAM CONVERGENCE DEVICE FOR COLOR PICTURE TUBE

Akio Ohgoshi, Tokyo, and Senri Miyaoka, Fujisawa-shi, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 6, 1969, Ser. No. 874,568
Claims priority, application Japan, Dec. 26, 1968, 43/96207
Int. Cl. H01j 29/50
U.S. Cl. 313—70 C 8 Claims

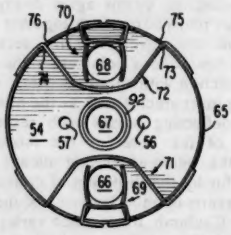


In a cathode-ray tube in which a plurality of electron beams are focused on a screen by a focusing lens from which at least certain of the beams emerge along paths divergent with respect to the tube axis, and each of the beams emerging along a divergent path is deflected to cause convergence of the beams at a common area of the screen; such deflection of each diverging beam is effected by a pair of plates at different electrical potentials disposed at opposite sides of the respective divergent path and an auxiliary electrode having open areas therein disposed along the outer side of the respective divergent path spaced inwardly from the plate which is at the side of the respective divergent path away from which the beam is deflected, this plate being at a relatively low potential and the auxiliary electrode and the other plate being at substantially the same relatively high potential to establish an electric field between the plates which, in the region thereof located between the other plate and the auxiliary electrode and being traversed by the respective beam, has a potential gradient that is maintained substantially constant irrespective of variations in the relatively high potential to avoid misconvergence due to such variations.

3,614,502
ELECTRON GUN CONVERGENCE ASSEMBLY

Frederick F. Doggett, 7544 Totman Road, East Syracuse, N.Y., and Leonard W. Jenne, Jr., 7469 Hillside Road, Baldwinsville 3, N.Y.

Division of Ser. No. 731,807, May 24, 1968. Filed Sept. 16, 1969, Ser. No. 870,766
Int. Cl. H01j 29/70
U.S. Cl. 313—77 4 Claims

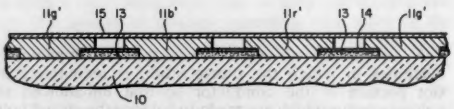


An electron gun assembly of the three gun, in-line type. The three guns each including a plurality of electrode elements are rigidly attached to four support rods or glass beads by a mounting means comprising four metal straps which connect each of the outer gun elements to two support rods and the center gun elements to all four support rods. A first group of four L-shaped metal tabs are imbedded in the ends of the support rods, and two mounting bars are each connected at both ends to two of the tabs for the purpose of making electrical connections to the gun heater elements. A second group of U-shaped metal tabs are also imbedded in the ends of the support rods to permit a mechanical connection of a stem component whereby the gun electrode elements are isolated from forces applied to the stem. A convergence assembly is self-registering with respect to the gun assembly by the alignment of precision holes in the base of the convergence assembly with cutouts provided in a flange on the center gun electrode. A plurality of slots are provided in the wall of the convergence assembly which permit self-registering of pole piece elements positioned inside the assembly.

3,614,503
BLACK-SURROUND COLOR PICTURE TUBE

Leonard Dietch, Skokie, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Feb. 24, 1970, Ser. No. 13,564
Int. Cl. G03c 5/00; H01j 29/32
U.S. Cl. 313—92 CS 7 Claims

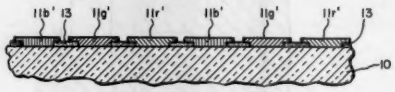


The screen area of a color cathode-ray tube has a multiplicity of phosphor dot triads and the individual phosphor dots are surrounded by a deposit of graphite or other light-absorbing material. The screen has at least two surfaces functioning as diffuse light reflectors. One surface is the customary backing layer of aluminum and the other is a light-reflecting layer applied over the graphite. Multiple reflections from these surfaces permit light developed by the phosphor dots and otherwise attenuated in the graphite to be added to the useful light output of the tube.

3,614,504
COLOR PICTURE TUBE SCREEN WITH PHOSPHORS DOTS OVERLAPPING PORTIONS OF A PARTIAL LIGHT TRANSMISSIVE BLACK-SURROUND MATERIAL

Sam H. Kaplan, Chicago, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Apr. 9, 1970, Ser. No. 27,052
Int. Cl. G03c 5/00; H01j 29/32
U.S. Cl. 313—92 CS 4 Claims

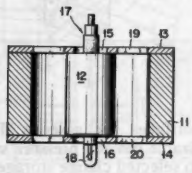


The screen area of a color cathode-ray tube is covered with a graphite layer which is discontinuous in the sense that it has holes into which various phosphor materials are deposited to form the usual dot triad arrangement. The phosphor dots overlap the graphite and the graphite has a transmissivity to visible light of at least 5 to 20 percent so that the overlapping parts of the phosphor dots make a contribution to useful light output.

3,614,505
PACKAGED MAGNETRON

Akihiro Fukatsu, Yokohama, and Masao Kato, Tokyo, both of Japan, assignors to Tokyo Shibaura Electric Co. Ltd., Kawasaki, Japan

Filed July 7, 1970, Ser. No. 52,892
Claims priority, application Japan, July 10, 1969, 44/65144
Int. Cl. H01j 25/50
U.S. Cl. 313—153 6 Claims

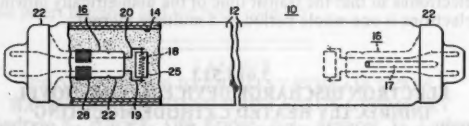


A packaged magnetron comprising a cylindrical permanent magnet coaxially disposed on the outer periphery of an anode, a radiator located between said magnet and anode, two circular conjugate yokes positioned on the magnet, facing each other, and a plurality of holes made in said yokes.

3,614,506
ELECTRIC DISCHARGE LAMP HAVING IMPROVED MERCURY-VAPOR CONTROL ASSEMBLY

George S. Evans, Caldwell, N.J., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of application Ser. No. 524,907, Feb. 3, 1966.
This application Apr. 29, 1970, Ser. No. 32,924
Int. Cl. H01j 61/24
U.S. Cl. 313—174 8 Claims

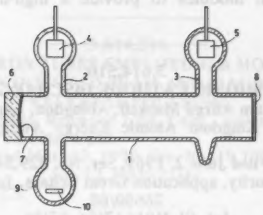


The mercury-vapor pressure within a fluorescent lamp is controlled by an amalgam-forming metal that is enclosed in a foraminous container supported at a selected location within the lamp envelope. The container is fabricated from two strips of wire mesh that are arranged in overlying enclosing relationship with a strip of amalgam-forming metal to form an assembly that is secured to one of the lamp stems. Leakage of the amalgam-forming metal and amalgam when in a fluid state is prevented by providing a border of overlapped wire mesh that is devoid of metal and extends around the periphery of the assembly. Alternatively, the border extends along the sides of the assembly and the ends of the assembly are rendered leakproof by a coating of a material that repels the amalgam or amalgam-forming metal. A method and apparatus for making continuous border-type assemblies on a mass production basis are also disclosed.

3,614,507
DEVICE FOR PRODUCING STIMULATED INFRARED EMISSION, IRASER, BY MEANS OF AN ELECTRIC DISCHARGE IN A GAS MIXTURE CONSISTING PARTLY OF CARBONIC ACID GAS, AND DISCHARGE TUBE DESTINED FOR SUCH A DEVICE

Wilhelmus Jacobus Witteman, and Pieter Zalm, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 6, 1969, Ser. No. 797,070
Claims priority, application Netherlands, Feb. 15, 1968, 6802135
Int. Cl. H01j 17/26, 61/24
U.S. Cl. 313—174 2 Claims

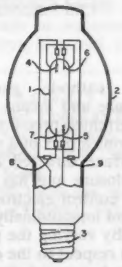


The efficiency of an iraser with a discharge in carbonic acid, helium, nitrogen, and water vapor reduces after a few hundreds of hours. This is prevented by contacting the gas filling with a substance which contains water with the correct vapor pressure, and by ensuring the supply of water vapor which has disappeared by absorption in the wall and in the electrodes. A suitable material is, for example, zeolite.

3,614,508
METAL HALIDE DISCHARGE LAMP CONTAINING BERYLLIUM

Saburo Ito, and Shingo Ezaki, both of Ohtsu, Japan, assignors to New Nippon Electric Company Ltd.

Filed Oct. 27, 1969, Ser. No. 869,554
Int. Cl. H01j 61/18
U.S. Cl. 313—184 4 Claims



A high-pressure electric discharge lamp which emits a continuous spectrum and containing beryllium, halogen and mercury. The lamp is operated at temperatures in the range of 300° to 700° C. to obtain white light emission of good color-rendering properties and brightness.

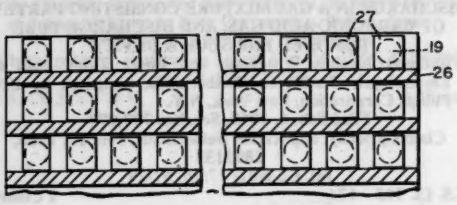
3,614,509
LARGE AREA PLASMA PANEL DISPLAY DEVICE

Robert H. Willson, Ellicot City, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 7, 1969, Ser. No. 822,623
Int. Cl. H01j 11/02, 65/04
U.S. Cl. 313—201 4 Claims

This invention is directed to a large area panel display

device whereby a high-density plasma display is provided from a number of modular building blocks to minimize the



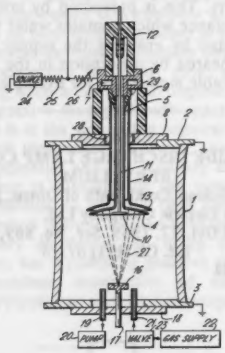
gaps between modules to provide a high-density display device.

3,614,510

NONTHERMIONIC CATHODE DISCHARGE DEVICES

Clifford William Alfred Maskell, Abingdon, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed June 2, 1969, Ser. No. 829,544
Claims priority, application Great Britain, June 4, 1968, 26600/68
Int. Cl. H01j 17/04, 17/26
U.S. Cl. 313—207 **13 Claims**



A nonthermionic cathode glow discharge device comprising an enclosure and means to maintain gas in the enclosure at a predetermined pressure. An anode is mounted in the enclosure or forms a part of a wall of the enclosure. A cathode having a surface directed at a treatment zone is suspended in the enclosure and has an aperture therein in which is positioned a control electrode. The said surface of the cathode may extend longitudinally or may be shaped as a segment of a sphere. By varying the potential applied to the control electrode with respect to the cathode, the focal point of the electron or ion beam and the current of the output beam can be controlled. A third electrode may be provided to surround part of the cathode to act as a screen to minimize unwanted electron emission from the cathode.

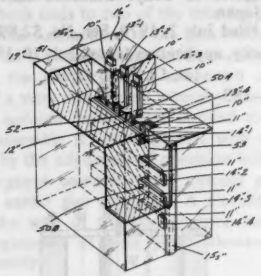
3,614,511

GAS DISCHARGE DISPLAY MEMORY DEVICE

Theodore C. Baker, Wayne; Wolfgang W. Bode, Sylvania; Richard G. Mathias, Toledo; James F. Nolan, Sylvania, and Lawrence V. Pfaender, Toledo, all of Ohio, assignors to Owens-Illinois, Inc.

Division of Ser. No. 686,384, Nov. 24, 1967, Pat. No. 3,499,167.
Filed Jan. 5, 1970, Ser. No. 783
Int. Cl. H01j 61/30, 65/04
U.S. Cl. 313—220 **3 Claims**

A simplified high resolution display and/or memory device having rugged nonconductive support members carrying matrix forming conductor arrays, inorganic dielectric adherent coating or film on the conductor arrays forming a plurality of discrete, but not physically isolated or localized,



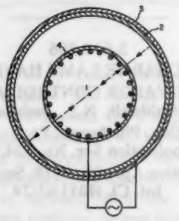
charge storage surfaces for gaseous discharge generated charges in an ionizable gas at a pressure sufficient to laterally confine charges to selected charge storage areas.

3,614,512

IONIZING DEVICE

Robert Evrard, Paris, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 14, 1969, Ser. No. 815,679
Claims priority, application France, Apr. 12, 1968, 148053
Int. Cl. H01j 27/00
U.S. Cl. 313—230 **1 Claim**



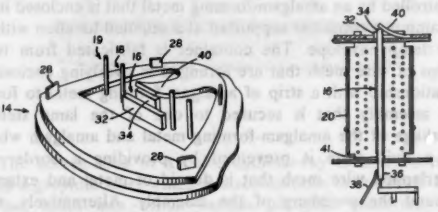
Ion source for use in an ion pump or other apparatus, comprising a secondary-emissive cylinder accommodating a grid. A high-frequency voltage is applied between these two electrodes so that the transit time of the diametrically moving electrons is one whole period or a multiple thereof.

3,614,513

ELECTRON DISCHARGE DEVICE HAVING NOVEL INDIRECTLY HEATED CATHODE MOUNTING

William A. Allgaier, Emporium, Pa., assignor to Sylvania Electric Products Inc.

Filed July 16, 1969, Ser. No. 842,154
Int. Cl. A47b 91/00, 47/00
U.S. Cl. 313—260 **4 Claims**



A cathode stop provided externally of the electron cage reduces noise and microphonics generated by loose cathode structures. The stop is utilized in conjunction with a

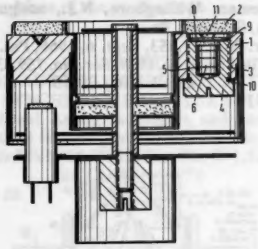
cantilevered mica tongue which exerts pressure on the cathode.

3,614,514

DISPENSER CATHODE STRUCTURE

Helmut Katz, and Erwin Hubner, both of Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed July 2, 1970, Ser. No. 51,891
Claims priority, application Germany, July 4, 1969, P 19 34 067.1
Int. Cl. H01j *1/14*
U.S. Cl. 313—346 **5 Claims**



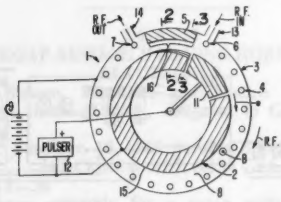
A dispenser MK-type cathode structure adapted for storage and/or handling with subsequent activation and a method of producing the same whereby a supply source substance for an emission-promoting substance (i.e., barium oxide) is positioned in an open end storage chamber of a pluglike insert member (composed of tantalum), and the supply source substance is surrounded with an inert atmosphere at ambient pressure and sealed by a gas impermeable foil member (composed of tantalum). A plurality of such insert members are mechanically mated with a ring-shaped cathode body member (composed of molybdenum) so that the foil member separates the supply source substance from the cathode body member. A suitably porous tungsten disk is mounted on the cathode member body in communication with the foil member so that by evacuating the area around the cathode structure the foil ruptures and the emission-promoting substance (released by heat from the supply source substance) is free to come into contact with the adjacent underside portions of the porous disk. Each of the insert members is provided with shaped contact surfaces to positively seal the foil members between the insert member and the body member.

3,614,515

CROSSED-FIELD REENTRANT STREAM TUBES HAVING AN IMPROVED DRIFT SPACE GEOMETRY

Andrew S. Wilczek, Old Bridge, N.J., assignor to Varian Associates, Palo Alto, Calif.

Filed June 2, 1969, Ser. No. 829,640
Int. Cl. H01j *25/42*
U.S. Cl. 315—3.5 **6 Claims**



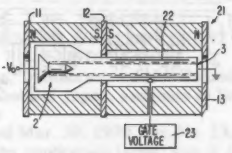
A crossed-field reentrant stream microwave tube is disclosed. The microwave tube includes an anode structure having a slow wave microwave circuit formed therein. A circuit sever interrupts the microwave circuit to define a microwave field-free drift space in the radial gap region between the circuit sever and the cathode structure. The surface of the cathode structure which faces the circuit sever is contoured to provide a varying radial spacing between the circuit sever and the cathode over a portion of the field-free drift region to enhance debunching of the reentrant electron stream. In a preferred embodiment, the cathode is contoured to provide both increasing radial spacing in the axial direction from both ends toward the center of the field-free region and also circumferentially contoured to provide increased cathode-to-anode spacing taken in the downstream direction of the drift region to move the electron stream away from the anode circuit at downstream end of the drift space which corresponds to the input end of the microwave circuit.

3,614,516

ELECTRON TUBES EMPLOYING A HOLLOW MAGNETRON INJECTED BEAM AND MAGNETIC FIELD REVERSAL FOCUSING

Robert M. Phillips, Redwood City, Calif., assignor to Varian Associates, Palo Alto, Calif.

Filed Mar. 13, 1970, Ser. No. 19,173
Int. Cl. H01j *25/34*
U.S. Cl. 315—3.5 **9 Claims**



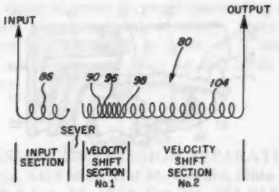
Electron beam tubes are disclosed which employ a magnetron injection electron gun for projecting a hollow beam of electrons axially of the tube and generally parallel to an axially directed beam-focusing magnetic field. The axial direction of the beam-focusing magnetic field is reversed abruptly within the beam path and an electrode, such as a gate, drift control electrode, slow wave circuit, or cavity resonator, is disposed in the field reversal region to obtain enhanced electronic interaction with the beam for a given electrical potential established on the interaction electrode. Use of this feature leads to improved high-power switch tubes, traveling wave tubes, klystrons, and RF delay tubes.

3,614,517

TRAVELING WAVE ELECTRON INTERACTION DEVICE HAVING EFFICIENCY ENHANCEMENT MEANS

Norman J. Dionne, Ithaca, N.Y., assignor to Raytheon Company, Lexington, Mass.

Filed Apr. 30, 1970, Ser. No. 33,459
Int. Cl. H01j *25/34*
U.S. Cl. 315—3.6 **8 Claims**



Phase-focusing means are introduced into a traveling wave electron interaction device to optimize exchange of electron kinetic energy with electromagnetic waves propagated along an adjacent wave-guiding structure by providing an

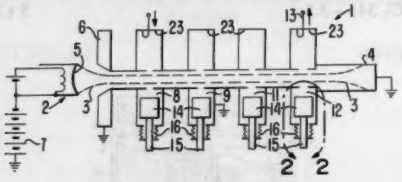
intermediate phase velocity profile at a relatively low level of electron beam energy extraction and well before tube saturation. The resultant redistribution of the guided wave phase velocity provides a delay in the electromagnetic circuit sufficient to permit advancement and desynchronizing of electron bunches to a position in the decelerating field of the propagated waves where the forces on the electrons are substantially minimal. Retention of electrons for longer periods in the decelerating field region of the circuit waves has resulted in a highly significant enhancement in efficiency in traveling wave tube performance. Application of similar phase velocity shift techniques has substantially reduced harmonic frequency power content leading to premature tube saturation in high-gain octave bandwidth devices to yield improvements in efficiency by approximately a factor of 2.

3,614,518

MICROWAVE TUNER HAVING SLIDING CONTACTORS

Robert C. Schmidt, Woodside, Calif., assignor to Varian Associates, Palo Alto, Calif.

Filed Mar. 16, 1970, Ser. No. 19,602
Int. Cl. H01j *23/20*
U.S. Cl. 315—5.53 **8 Claims**



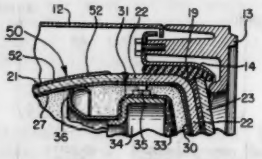
A microwave tuner having sliding electrical contactors is disclosed. The tuner includes a plunger structure movable within a hollow, evacuated microwave conductor, as of copper. The plunger includes a tungsten helix with the turns of the helix being fixedly secured near the leading edge of the plunger with the plane of the turns of the helix being generally parallel to the direction of movement of the plunger and with the trailing edge of the helix being free to move relative to the plunger. The loop formed by each turn of the helix has a generally oblong configuration with major and minor axes to be compressed between the opposed walls of the microwave conductive structure to be tuned, with the minor axes of the loops intersecting the walls to be contacted.

3,614,519

CATHODE-RAY TUBE MAGNETIC SHIELD

Raymond C. Figlewicz, Park Ridge, and John L. Rennick, Elmwood Park, both of Ill., assignors to Zenith Radio Corporation, Chicago, Ill.

Filed Dec. 18, 1967, Ser. No. 691,401
Int. Cl. H01j *29/06;* H01n *9/16*
U.S. Cl. 315—8 **2 Claims**



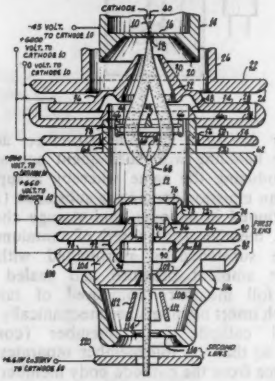
A color cathode-ray tube assembly comprises a hollow envelope that has a neck section enclosing an electron gun apparatus for developing three electron beams and further has a funnel section a portion of which encloses a beam control electrode in the form of a shadow mask disposed across the path of the beams to achieve color selection. The beams are shielded from interfering magnetic fields by a shield formed of a pliable foil of magnetic material. This foil is positioned and secured upon the aforesaid portion of the funnel section and is patterned to conform to the contour of the funnel so as to be in magnetic coupling relation to the shadow mask. The foil supplants the aquadag coating heretofore applied to the outside surface of the funnel to serve as the grounded electrode of a filter capacitor for the high voltage power supply which energizes the tube.

3,614,520

ELECTRON BEAM INJECTOR AND FOCUSING MEANS SUITABLE FOR ELECTRON MICROSCOPE

John W. Coleman, Willingboro, N.J., assignor to Forgflo Corporation, Sunburg, Pa.

Division of Ser. No. 577,353, Sept. 6, 1966, Pat. No. 3,452,241.
Filed Sept. 12, 1968, Ser. No. 759,431
Int. Cl. H01j *29/58*
U.S. Cl. 315—15 **6 Claims**



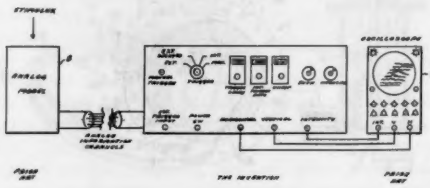
An electron beam focusing means including a grid cap and accelerating lenses is provided. To permit a small change of voltage on the grid cap to overcome the defocusing effect of a great change in voltage on the accelerating electrodes, a short focal length accelerating lens is positioned in the front focal length of the long focal length lens constituted by the high voltage accelerating electrodes.

3,614,521

MULTICHANNEL MULTIPLEXED QUASI THREE-DIMENSIONAL DISPLAY SYSTEM

Erich E. Brueschke, Homewood, Ill., assignor to The United States of America as represented by the Secretary of the Air Force

Filed Nov. 28, 1969, Ser. No. 880,881
Int. Cl. H01j *29/70*
U.S. Cl. 315—22 **6 Claims**



Analog signals on a plurality of channels are processed through electronic ultrafast multiplexing and timing control

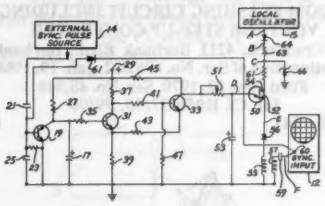
circuits to present control signals to the X, Y, and Z inputs of a conventional single-beam oscilloscope for providing a skewed display of the presentation of the plurality of channels on the oscilloscope. This results in a quasi three-dimensional representation of the signals. The analog signals on each channel are characteristically instantaneously one-dimensional in signal amplitude; each channel is then displaced in a skewed relationship and supplies in pseudodepth the second dimension such as frequency, (in some applications the second dimension may be position); time then being the third dimension in which the channel information is presented. The skewing of the channel presentation coupled with intensity modulation of the individual channels proportional to each individual channel signal amplitude creates the three-dimensional effect on the two-dimensional face of the oscilloscope.

3,614,522

CIRCUIT FOR AUTOMATICALLY SELECTING ONE OF TWO SYNCHRONIZING PULSE SOURCES

Michael J. Halinski, Arlington Heights, and Larry Wanschek, Chicago, both of Ill., assignors to Sun Electric Corporation

Filed Feb. 24, 1969, Ser. No. 801,526
Int. Cl. H01j *29/70*
U.S. Cl. 315—26 **4 Claims**



A signal control circuit for applying a synchronizing signal to an oscilloscope circuit from a local frequency generator whenever an external source of triggering signals is unavailable, disabled or inadvertently disconnected. When available, the external triggering signal is applied both to the synchronizing input of the conventional scope circuitry and to the gate electrode of a silicon-controlled rectifier which maintains a capacitor in a discharged state. Whenever the voltage across this capacitor rises due to a loss of external triggering signals, a transistor-switching circuit applies voltage through a variable resistance to a timing capacitor, in turn, causing a unijunction transistor to "fire" periodically in delayed phase synchronism with a local signal generator, thereby producing a secondary source of pulses which are automatically applied to the oscilloscope.

3,614,523

SPARKGAP ASSEMBLY HAVING HORNGAP END ELECTRODES

Earl W. Stetson, Pittsfield, and Francis J. Charewicz, Lanesboro, both of Mass., assignors to General Electric Company

Filed Dec. 18, 1969, Ser. No. 886,102
Int. Cl. H01t *5/00*; H02h *9/06*
U.S. Cl. 315—36 **16 Claims**

A sparkgap assembly for a surge voltage arrester is provided with a plurality of elongated electrodes mounted between stacked plates of insulating material to form a zigzag discharge path through the sparkgap assembly when it is sparked over. The sparkgap assembly is provided with uniquely formed end plates that provide corona shielding and contact the outer electrodes of the assembly in a manner such that these electrodes develop an arc-moving, horngap

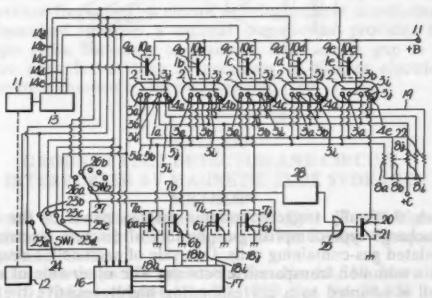
effect when an overvoltage surge is discharged through the assembly.

3,614,524

DISPLAY SYSTEM WITH DIFFERENT INTENSITY INDICATION

Koichi Kojima, Ichikawa, and Tadahiko Nakamura, Sagamihara, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 30, 1970, Ser. No. 23,562
Claims priority, application Japan, Apr. 3, 1969, 44/25827
Int. Cl. H03k *23/18*
U.S. Cl. 315—84.6 **8 Claims**



A display system for displaying place-indicating points darker than a decimal point to avoid misreading of the latter. Electrodes for place indication every three figures in indicator tubes are arranged to glow in a time-divisional manner with less duty cycle than an electrode for decimal point indication.

3,614,525

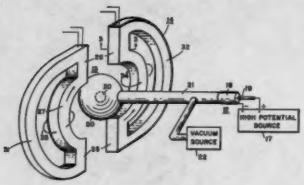
PLASMA COMPRESSION APPARATUS

Robert E. Uleski, 1410 West 21st St., Lorain, Ohio

Filed Jan. 14, 1969, Ser. No. 791,018
Int. Cl. H01j *17/14*; H05h *1/10*
U.S. Cl. 315—111 **9 Claims**

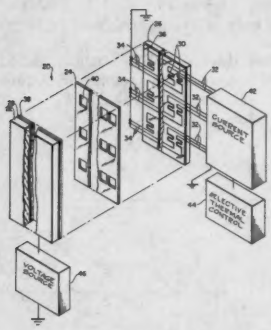
Apparatus to compress a plasma or ionized medium by the use of a generally spherical field produced by a generally spherical winding or field means. The current flows generally in the same direction on the conductors which surround an

envelope containing the plasma to produce a weak field or null field in the central region of the envelope with a stronger



field surrounding this weak field which effectively compresses the plasma into the central region.

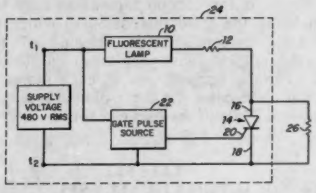
3,614,526
METHOD AND MEANS FOR OPERATING A PLASMA DISPLAY PANEL
John L. Janning, Dayton, Ohio, assignor to The National Cash Register Company, Dayton, Ohio
Filed May 28, 1970, Ser. No. 41,260
Int. Cl. H01j *11/00*
U.S. Cl. 315—169 **9 Claims**



A thermally triggered plasma display panel of the gas-discharge type comprising a plurality of discrete electrically isolated gas-containing cells. One side of each cell is coupled to a common transparent electrode. The other side of each cell is coupled to a corresponding highly resistive thermal electrode. All of the electrodes in the plasma display panel are separated from the gas medium by a thin transparent dielectric coating of glass.

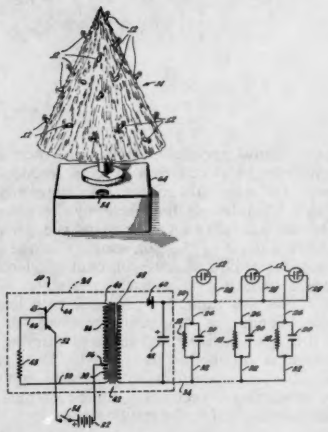
The method by which ionization is established is to apply a continuous alternating field across the common electrode and all of the thermal electrodes, thus placing each cell under the influence of a continuous alternating electric field. The magnitude of the applied electric field is insufficient to establish ionization, at normal cell pressures, within the respective cells, but is sufficient to sustain ionization upon the initiation of ionization within the respective gas cells. Ionization is initiated by the momentary application of current, which produces a quick heat. An increase in cell pressure, caused by the quick heat, results in a lower ionizing voltage. Therefore, the current pulse, in cooperation with the alternating electric field, initiates ionization within the cells corresponding to the current-pulsed thermal electrodes. The magnitude of the alternating field is sufficient to sustain ionization once ionization is initiated, thus providing the illumination necessary for the display of the desired information.

3,614,527
FLUORESCENT-LAMP-DIMMING CIRCUIT
John S. Wirtz, Rochester, N.Y., assignor to Itek Corporation, Lexington, Mass.
Filed June 27, 1969, Ser. No. 837,218
Int. Cl. H05b *37/02*
U.S. Cl. 315—199 **2 Claims**



A circuit to permit continuous control, over a substantial range, of the power supplied to a negative-resistance load such as a fluorescent lamp. A conventional dimming circuit including a lamp load, a source of cyclically varying voltage and a silicon-controlled rectifier is modified by the inclusion of an impedance shunted across the silicon-controlled rectifier. The impedance permits improved control of the amount of power being supplied to the lamp load and hence of its intensity of illumination, especially at low levels of power.

3,614,528
RANDOM FLASHING CIRCUIT INCLUDING A VOLTAGE STEP-UP CONVERTER
Charles L. Craddock, 4211 Burbank Blvd., Burbank, Calif.,
Continuation of Ser. No. 696,832, Jan. 10, 1968
Filed June 22, 1970, Ser. No. 48,940
Int. Cl. H05b *37/00, 39/00*
U.S. Cl. 315—241 **6 Claims**



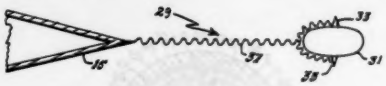
An electrical circuit for periodically and essentially randomly flashing a plurality of gas discharge tubes, particularly for decorative effect. A plurality of gas discharge tubes are connected with associated resistor and capacitor combinations in a relaxation oscillator configuration. A sufficiently high voltage to operate the parallel relaxation oscillators is derived from a low-voltage source and a DC to DC voltage step-up converter. The converter comprises a transistor oscillator of the Hartly type with the main frequency determining coil and the feedback coil being the primary winding of a step-up transformer. The oscillator is powered by the low-voltage DC source and the stepped-up AC voltage appearing at the secondary of the transformer is rectified and filtered to supply the sufficiently high voltage to operate the plurality of flashing circuits.

3,614,529

LOW-NOISE CORONA DISCHARGE DEVICE

Joseph E. Nanevicz, Palo Alto, Calif., assignor to the United States of America as represented by the Secretary of the Air Force

Filed Feb. 18, 1970, Ser. No. 12,328
Int. Cl. H05f 3/06
U.S. Cl. 317—2 E 2 Claims



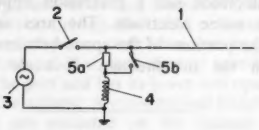
A static-discharger system for achieving corona discharge noise reduction including a dielectrically decoupled discharger having a body made of high dielectric constant material suspended at the trailing edge of the aircraft wing. One or more discharge pins are located at positions along the minimum coupling line on the body. The discharge pins are connected to the airframe via a high-resistance band that extends aft only as far as the discharging pin.

3,614,530

ARRANGEMENT FOR DAMPING ELECTRICAL OSCILLATIONS ON A HIGH-VOLTAGE ALTERNATING CURRENT TRANSMISSION LINE

Paul Baltensperger, Wurenlos, Switzerland, assignor to Aktiengesellschaft Brown, Boveri & Cie, Baden, Switzerland

Filed July 7, 1969, Ser. No. 839,454
Claims priority, application Switzerland, Aug. 2, 1968, 11622/68
Int. Cl. H02h 7/22
U.S. Cl. 317—11 C 5 Claims



An arrangement for damping electrical oscillations on a high-voltage line formed in an oscillatory circuit constituted by a compensating inductive reactor and the capacitance of the line itself comprises with a resistance component arranged in series with the inductive reactor, and with this series circuit connected between the line and earth at the line side of a circuit breaker employed at one end of the line to connect and disconnect the line with respect to its source of power such as a power station. An auxiliary switch is paralleled with the resistance component. During a disconnection procedure, the main circuit breaker and the auxiliary switch shunting the resistance component open practically simultaneously so that the resistance component becomes effective for a brief duration after which it recloses the shunt path around the resistance component. The resistance component and its shunting switch are structurally associated with the reactor component and its casing and can be mounted either on the exterior of or within this casing.

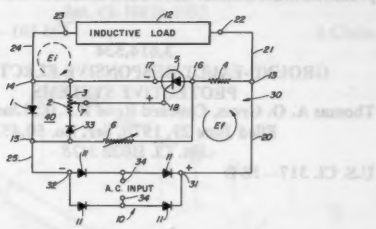
3,614,531

SHUNT MEANS FOR PROTECTING A POWER SUPPLY AGAINST BACK EMF

Joseph V. Oswald, 2852 South Central Park Ave., Chicago, Ill.

Continuation-in-part of application Ser. No. 715,893, Mar. 25, 1968, now abandoned. This application Aug. 18, 1970, Ser. No. 64,731
Int. Cl. H02h 7/10
U.S. Cl. 317—16 7 Claims

A protective circuit for protecting a rectifier system or other direct current power supply from an excessive inverse-polarity voltage, comprising a diode or other unidirectionally conductive control device connected in series with the power supply and a load, a sensing resistance connected across the diode, a signal-controlled semiconductor gate device such as an SCR connected across the load, and a shunt resistance connected across the power supply. The gate device is driven conductive by a control signal from the sensing resistor



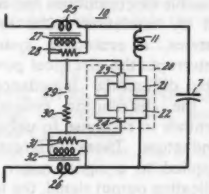
whenever an inverse-polarity voltage occurs, preventing the voltage from reaching the power supply. In the preferred-construction, a blocking diode is connected in series with the sensing resistor.

3,614,532

TRIGGERED VACUUM GAP KEEP-ALIVE CIRCUIT

Sidney R. Smith, Jr., Lenox, Mass., and Willem F. Westendorp, Schenectady, N.Y., assignors to General Electric Company

Filed June 1, 1970, Ser. No. 42,326
Int. Cl. H02h 7/16
U.S. Cl. 317—16 4 Claims



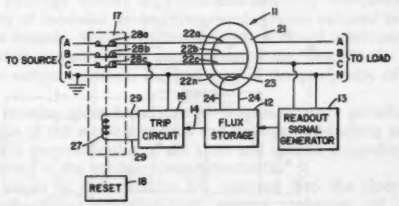
This disclosure relates to a "keep-alive" circuit for a triggered vacuum gap wherein the duration of the usual trigger pulse is insufficiently long to maintain the vacuum gap in an active state for more than one-half cycle at the powerline frequency. A circuit utilizing current transformers is described wherein a current transformer provides the trigger pulse necessary to maintain the vacuum gap in an active state for as long as necessary to protect electrical equipment shunted by the vacuum gap.

3,614,533

GROUND FAULT DETECTOR AND CIRCUIT INTERRUPTER BY MAGNETIC FLUX STORAGE METHOD

Ellwood S. Douglas, Orinda, and Wallace W. Wahlgren, Oakland, both of Calif., assignors to The Rucker Company, Oakland, Calif.

Continuation-in-part of application Ser. No. 18,518, Mar. 10, 1970. This application May 20, 1970, Ser. No. 39,056
Int. Cl. H02h 3/16
U.S. Cl. 317—18 D 33 Claims



Miniaturized ground fault detector and current interrupter in which fault signals are stored in the form of magnetic flux in an inductor core. The core has a low input impedance and is driven by a differential transformer having a small core and a single-turn secondary winding. Means is provided for reading the stored flux signals out of the inductor core and

operating a circuit breaker in response thereto. Means is also provided for counting the number of signals readout of the core and delaying the operation of the circuit breaker until a predetermined number have been counted.

3,614,534

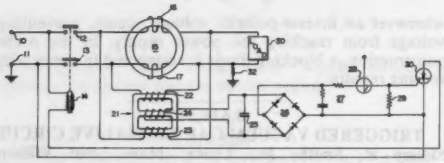
GROUND-FAULT-RESPONSIVE ELECTRICAL PROTECTIVE SYSTEMS

Thomas A. O. Gross, Concord Road R.F.D., Lincoln, Mass.

Filed June 29, 1970, Ser. No. 50,453

Int. Cl. H02h *3/28*

U.S. Cl. 317—18 D **17 Claims**



To prevent possible electrocutions and to minimize the risk of fires caused by insulation faults in electrical power distribution systems, a protective system responsive to ground faults interrupts the electrical power. Ground faults are detected by differential impedances in the supply conductors of the distribution system, which develop differential potentials in response to unbalanced currents in the supply conductors. These differential potentials are tapped and supplied to a signal mixer which develops a ground-fault-indicating output signal, the magnitude of which depends on the degree of current imbalance. Output signals exceeding a threshold value trip a circuit breaker to remove power from the load conductors. Unlike some currently popular ground fault systems, the combination can be made very sensitive to ground faults of either high or low resistances.

3,614,535

VOLTAGE TRANSFORMER

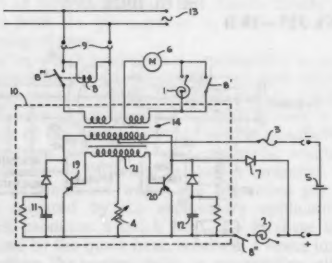
Konstantin Apel, Meersburg, Germany, assignor to Holzer Patent AG, Zug, Switzerland

Filed Feb. 25, 1970, Ser. No. 13,934

Claims priority, application Germany, Feb. 26, 1969, P 19 09 746.2

Int. Cl. H02h *5/04*

U.S. Cl. 317—40 A **8 Claims**



A device and electric circuit to supply a voltage to a consumer with means to switch over from a network to battery-powered operation.

3,614,536

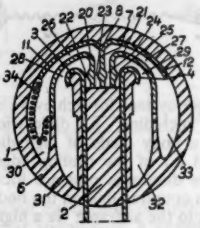
SPARK GAP WITH MAGNETIC BLOWING OF THE ARC

Bengt Johansson, and Erland Nilsson, both of Ludvika, Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed July 13, 1970, Ser. No. 54,518

Int. Cl. H02h *9/06*

U.S. Cl. 317—74 **7 Claims**



A spark gap is formed between two discs of insulating material resistant to the arc and with a space therebetween. Two outer electrodes extend through the space between the discs from one side almost to the other periphery. These electrodes are insulated through most of their length on their outer faces. An intermediate electrode is arranged on the inner wall of the space facing the two outer electrodes and extending angularly a substantial distance around such inside wall. This electrode has a protrusion opposite the space between the outer electrode. The arcs are magnetically drawn into the portions of the space between the electrodes remote from the intermediate electrode and are there extinguished.

3,614,537

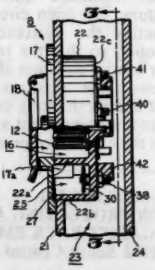
INTEGRAL-BREAKER TRAILER SOCKET WITH BIMETALLIC BREAKER BLADES

Angelo Introvigne, Stafford Springs, Conn., assignor to Cole-Hersee Company, South Boston, Mass.

Filed Nov. 4, 1969, Ser. No. 873,824

Int. Cl. H02b *1/10;* **H01h** *37/52*

U.S. Cl. 317—99 **7 Claims**



Multipole sockets for electrical cabling connections with truck trailers are provided with built-in circuit breakers which are clustered and protectively housed in a compact annular array around a central socket opening and are equipped with terminals affording circuit connections through protective breakers.

3,614,538

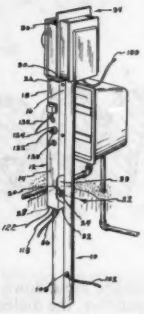
MOUNTING PEDESTAL FOR UTILITIES

Anne D. Nickola, Diane Trailer Park, G-6255 North Saginaw Road, Mount Morris, Mich.

Continuation-in-part of application Ser. No. 684,199, Nov. 20, 1967, now Patent No. 3,502,785. This application Feb. 26, 1970, Ser. No. 14,578

Int. Cl. H02g 9/00

U.S. Cl. 317—99 22 Claims



An improved mounting pedestal adapted to support an electrical power box, an electric meter, a telephone box, a television jack, and a gasmeter operatively in a compact arrangement for providing utility services to a mobile home. A hollow, rectangular metal post is supported in an upright position in the ground, extending thereabove, and supports a mounting bracket on the top thereof. A conventional electric meter and electrical power outlet box are supported by the bracket. An elongated U-shaped channel member is secured to one side of the post and has its lower end opening beneath the surface of the ground. A conventional telephone box and television jack are mounted on the channel member. A conventional gasmeter is mounted on the opposite side of the post from the channel member.

3,614,539

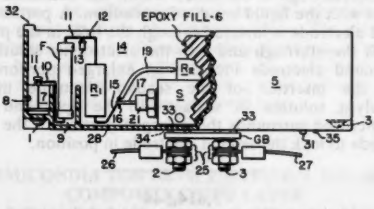
INTRINSICALLY SAFE SYSTEM INCLUDING ELECTRICAL BARRIER WITH EXTERNAL CONNECTORS

Bennett Hallenbeck, Tustin, Calif., assignor to Sybron Corporation, Rochester, N.Y.

Filed June 2, 1969, Ser. No. 829,491

Int. Cl. H02b 1/10

U.S. Cl. 317—99 7 Claims



A system having a nonhazardous area and a hazardous area electrically intercommunicate via an electrical barrier. The barrier fails safe, limits both voltage and current, and consists essentially of a monolithic, nonrepairable, ground-bus-mounted circuit having a fuse and three resistors in series, and a pair of zener diodes which break down with excessive voltages at intermediate points of the series resistance.

3,614,540

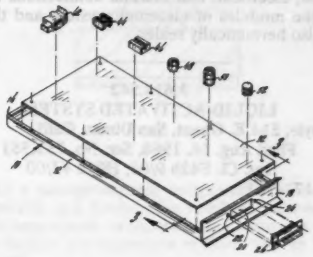
SUPPORT TRAY FOR PRINTED CIRCUIT BOARDS

Eugene A. Slusser, R.F.D. 1, Concord, N.H.

Filed Mar. 27, 1970, Ser. No. 23,395

Int. Cl. H02b 1/02

U.S. Cl. 317—101 DH 1 Claim



A support tray for printed circuit boards of the type used in life test and burn-in oven systems, particularly a support tray used to support a test printed circuit board and test components during burn-in. The support tray is characterized by its rigidity, ease of handling with the test components positioned thereon and insulated within the oven.

3,614,541

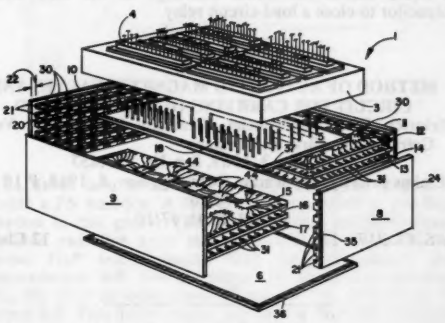
PACKAGE FOR AN ELECTRONIC ASSEMBLY

William A. Farrand, Fullerton, Calif., assignor to North American Rockwell Corporation

Filed Apr. 8, 1969, Ser. No. 814,306

Int. Cl. H05k 1/04

U.S. Cl. 317—101 2 Claims



The package houses an electronic assembly comprising a plurality of modules having integrated circuits secured to the module boards. Wiring patterns on each board interconnect integrated circuit leads and connect the circuits to the module output contacts formed around the periphery of the board.

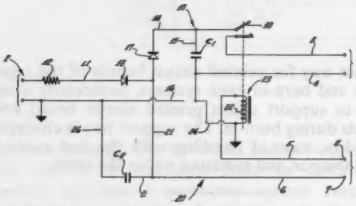
The housing sides have interior slots which are parallel to the edges of the module boards and include conducting strips which are perpendicular to the slots and spaced according to the spacing of the module output contacts.

The edges of the modules are inserted into the slots for interconnecting corresponding output contacts of the modules through the conducting strips. At least one housing cover plate includes a circuit pattern on its interior surface which has contact terminals about its periphery and connecting pins on its external surface which are electrically connected to the circuit pattern. The plate is placed over the top of the assembled modules for electrically connecting the corresponding contacts of the modules through its circuit

pattern to the connecting pins. The other housing cover plate which may or may not be provided with a circuit pattern and connecting pins completes the package.

After the package has been assembled, it is subjected to an environment for fusing the module output contacts to the conducting strips and for fusing the cover plates to the housing so that a package can be produced with fused mechanical, electrical, and thermal connections being made between the modules of electronic system and the package which is also hermetically sealed.

3,614,542
LIQUID-ACTIVATED SYSTEM
Jan R. Coyle, 514 E. Ghent, San Dimas, Calif.
Filed Aug. 14, 1968, Ser. No. 752,551
Int. Cl. F42b 9/08; H01h 47/00
U.S. Cl. 317—151 **18 Claims**

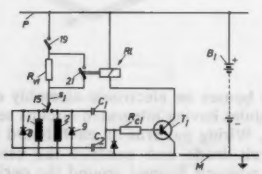


A liquid-activated system in which a load circuit includes a capacitor discharged upon immersion of electrodes in liquid.

Such a system in which a separate capacitor is discharged upon immersion of the electrodes in a liquid to close the load circuit and allow discharge of its capacitor.

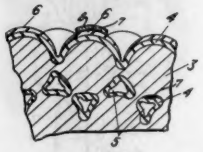
Such a system in which the immersion of the electrodes in a liquid causes the initial discharge of the load circuit capacitor to close a load circuit relay.

3,614,543
METHOD OF ACTUATING MAGNETIC VALVES AND CIRCUIT FOR CARRYING OUT SAID METHOD
Heinrich Dick, Heidenheim, Germany, assignor to Voith Getriebe KG, (Breny), Germany
Filed Nov. 3, 1969, Ser. No. 873,457
Claims priority, application Germany, Nov. 8, 1968, P 18 07 748.0
Int. Cl. H01h 47/10
U.S. Cl. 317—154 **12 Claims**



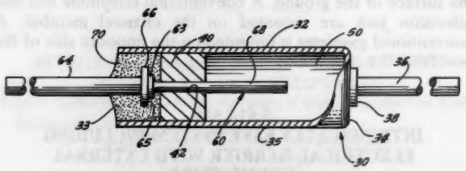
The specification discloses a control circuit for electromagnetic devices and a method of operating such devices in which a higher voltage is supplied for actuating the devices to pull the armatures thereof to attracted position, while a lower voltage is supplied to hold the armatures in attracted position. In the circuit the coils of the electromagnetic devices are connected across a line in series with a voltage-dropping resistor and a bypass around the voltage-dropping resistor is closed automatically when a switch pertaining to a coil to be energized is moved to coil-engaging position.

3,614,544
SOLID ELECTROLYTIC CAPACITORS HAVING AN ADDITIONAL INSULATED LAYER FORMED ON THE DIELECTRIC LAYER
Wolfgang Mosebach, South Devon, England, and Christopher Peter Piper, Fife, Scotland, assignors to International Standard Electric Corporation, New York, N.Y.
Filed Dec. 8, 1969, Ser. No. 883,088
Claims priority, application Great Britain, Dec. 13, 1968, 59340/68
Int. Cl. H01g 9/05
U.S. Cl. 317—230 **7 Claims**



To improve the voltage breakdown and leakage current of solid electrolytic capacitors, the dielectric layer is reenforced by an additional layer of silicon nitride, silicon dioxide or increasing the thickness of the original dielectric layer.

3,614,545
ELECTROLYTIC CELL HAVING IMPROVED CONSTRUCTION
Robert Roese, Los Angeles, Calif., assignor to The Bissett-Berman Corporation, Santa Monica, Calif.
Filed Apr. 13, 1970, Ser. No. 27,639
Int. Cl. H01g 9/08
U.S. Cl. 317—230 **8 Claims**

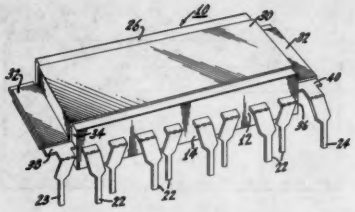


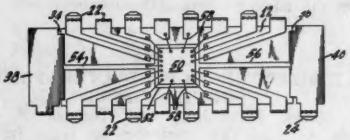
An electrolytic cell comprising a first electrode and a second electrode. The first electrode is formed as a container having an open end, a closed end, and a wall. An electrolytic solution is contained within the container. A plug having a hole therethrough is contained within the container and in contact with the liquid conductive medium. A portion of the second electrode is inserted through the hole in the plug and extends therethrough and into the electrolytic solution and the second electrode includes an enlarged portion which limits the insertion of the second electrode into the electrolytic solution. A sealant fills the open end of the container and surrounds the enlarged portion of the second electrode to lock the second electrode in position.

3,614,546
SHIELDED SEMICONDUCTOR DEVICE
Jack Avins, Princeton, N.J., assignor to RCA Corporation
Filed Jan. 7, 1970, Ser. No. 1,246
Int. Cl. H01l 3/00, 5/00
U.S. Cl. 317—234 R **7 Claims**

A dual-in-line type device comprises an elongated, rectangular envelope. Emerging from each of two opposed, elongated sides of the envelope is a row of leads. Disposed along the other elongated envelope sides are a pair of elongated shield members having end portions disposed

along the end sides of the envelope. The shield end portions are secured to conductive members extending outwardly





through the end sides. Within the envelope, a semiconductor pellet is mounted on a substrate connected to the conductive members.

3,614,547

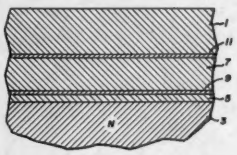
TUNGSTEN BARRIER ELECTRICAL CONNECTION

John E. May, Skaneateles, N.Y., assignor to General Electric Company

Division of Ser. No. 765,292, Oct. 7, 1968, Pat. No. 3,337,174. Filed Mar. 16, 1970, Ser. No. 19,872

Int. Cl. H01l *5/00*

U.S. Cl. 317—234 **5 Claims**



A tungsten or molybdenum electrical connector is attached to a surface of a semiconductor element adjacent an N-type region by a bonding layer comprised of aluminum. A tungsten or molybdenum refractory metal barrier layer is interposed between the bonding layer and the semiconductor surface, and thin refractory metal silicide layers are interposed between the bonding layer and the electrical connector and barrier layer. The bonding layer may be formed of an alloy of silicon and aluminum. An aluminum preform may be initially stacked between the refractory metal surfaces to form the bonding layer. The refractory metal silicide may be formed before bonding or may be formed by reaction of silicon with the refractory metal surfaces during bonding. The resulting electrical connection formed exhibits reduced internal resistance.

3,614,548

SEMICONDUCTOR DEVICE HAVING A TiO_2-SiO_2 COMPOSITE OXIDE LAYER

Morio Inoue, Takatsuki, Japan, assignor to Matsushita Electronics Corporation, Osaka, Japan

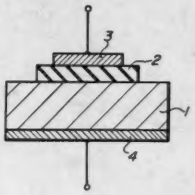
Filed June 11, 1970, Ser. No. 45,332

Claims priority, application Japan, June 18, 1969, 49150/69

Int. Cl. H01l *3/00*

U.S. Cl. 317—234 **4 Claims**

A surface protective layer or surface insulating layer of a composite oxide which is formed of silicon dioxide (SiO_2) to which is added with less than 0.02 percent by weight of titanium dioxide (TiO_2) stabilizes and improves the characteristics of the semiconductor device of a single layer formed of silicon oxide. The above-mentioned semiconductor device is provided by mixing small amount of gaseous organic compounds of titanium such as triisopropyl



titanate with a gaseous organic compound of silicon such as tetraethoxysilane and leading the resultant gaseous mixture onto a predetermined semiconductor substrate which is heated and held at a temperature of from 300° to 500° C. to react therewith.

3,614,549

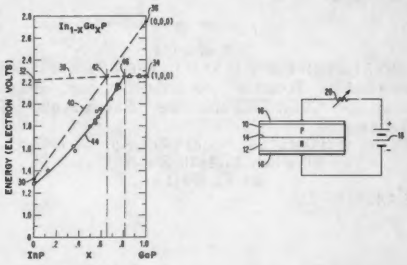
SEMICONDUCTOR RECOMBINATION RADIATION DEVICE

Max R. Lorenz, Mahopac, and Arthur H. Nethercot, Jr., Hastings on Hudson, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 15, 1968, Ser. No. 767,742

Int. Cl. H01l *15/00*

U.S. Cl. 317—234 **11 Claims**



The diode is a formed alloy of InP and GaP doped to provide a PN junction. A forward bias is applied to produce radiation in the green. The alloy provides efficient direct transition radiation even though it includes more of the indirect GaP semiconductor GaP than the direct gap semiconductor InP. For an output of about 2.2 electron-volts, the alloy includes about 80 percent gap and about 20 percent InP. This highly visible output is achievable with this alloy because the energy difference between the (000) aligned (direct) conduction band minima and the (100) misaligned (indirect) conduction band minima in InP is greater than the energy difference between the corresponding aligned and the misaligned minima in GaP. Also, the energy level for the misaligned minima in InP is essentially at the same energy level as the misaligned minima in GaP. Diodes are also formed of alloys of other III–V compounds.

3,614,550

SEMICONDUCTOR LASER DEVICE WITH IMPROVED OPERATING EFFICIENCY

John C. Marinace, and Ralph C. McGibbon, both of Yorktown Heights, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

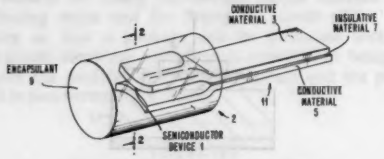
Filed Jan. 9, 1969, Ser. No. 790,116

Int. Cl. H01l *15/00*

U.S. Cl. 317—234 R **3 Claims**

An improved electromagnetic wave-emitting device is provided. A high pressure is applied to the device by potting

the device in a suitable encapsulant. The potted device exhibits a decreased threshold current density and an



increase in its efficiency. Additionally, the device has a more durable structure and an increased shelf life.

3,614,551

OHMIC CONTACT TO ZINC SULFIDE DEVICES

Robert Jenkins, Cupertino; Carver A. Mead, Pasadena, and James McCaldin, South Pasadena, all of Calif., assignors to Monsanto Company, St. Louis, Mo.

Filed Apr. 25, 1969, Ser. No. 824,898
Int. Cl. H01l *9/00, 15/00*
U.S. Cl. 317—234 **9 Claims**

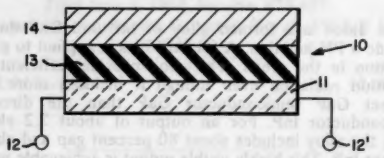
A zinc sulfide body is treated to form an ohmic contact by applying a Group II metal or alloy thereof to a surface region of the body in the presence of a source of donor precursor such as a Group IIIb metal or a halogen and heating the region to a temperature above the melting temperature of the metal or alloy.

3,614,552

INSULATED GATE FIELD EFFECT TRANSISTORS

Hans-Joachim Teuschler, Berlin, Germany, assignor to Kombinat VEB Elektonische Bavelemente, Teltow, Germany

Division of Ser. No. 819,419, Apr. 25, 1967.
Filed Feb. 16, 1970, Ser. No. 14,840
Int. Cl. H01l *11/14*
U.S. Cl. 317—235 **2 Claims.**



An insulated gate field effect transistor the semiconductor channel layer of which is constituted of lustrous carbon doped with an oxide or carbide of an element of Group IV of the Periodic System. This layer may be prepared by pyrolyzing in the presence of an alkali-free substrate for the layer a compound the pyrolysis of which yields both the carbon and the oxide or carbide.

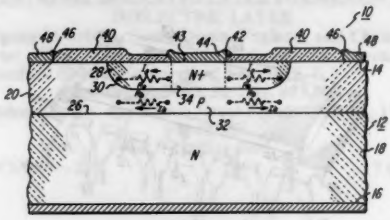
3,614,553

POWER TRANSISTORS HAVING CONTROLLED EMITTER IMPURITY CONCENTRATIONS

David Louis Franklin, and Barry Joel Fehder, both of Somerset, N.J., assignors to RCA Corporation

Filed Sept. 17, 1970, Ser. No. 73,027
Int. Cl. H01l *11/14*
U.S. Cl. 317—235 **3 Claims**

A power transistor having emitter, base, and collector regions, with the impurity concentration in the emitter region controlled so that the sheet resistance of that region adjacent the emitter-base junction is approximately equal to the sheet



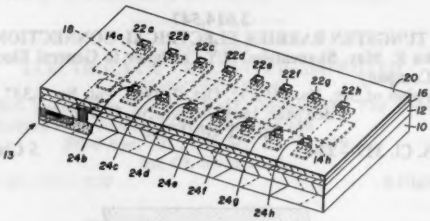
resistance of the base region underneath the emitter region, divided by the maximum beta of the transistor.

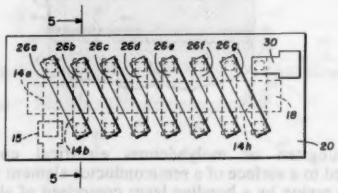
3,614,554

MINIATURIZED THIN FILM INDUCTORS FOR USE IN INTEGRATED CIRCUITS

Richard Shield, Richardson, and Thomas H. Ramsey, Garland, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 24, 1968, Ser. No. 770,375
Int. Cl. H01l *19/00*
U.S. Cl. 317—235 R **9 Claims**





Thin film inductors for use with miniaturized integrated circuits are fabricated by forming a first level of parallel metal strips on a substrate and then forming an insulating layer over the strips. A bar of magnetic material is disposed along the center portions of the metal strips and a layer of insulation is deposited over the bar of magnetic material. A second level of parallel metal strips is then formed over the layer of insulation and is connected between opposed ends of adjacent ones of metal strips at the first level to form a continuous flattened coil around the bar of magnetic material. In other embodiments of the invention, the bar of magnetic material may be omitted, or may be disposed outside the continuous flattened coil formed by the metal strips.

3,614,555

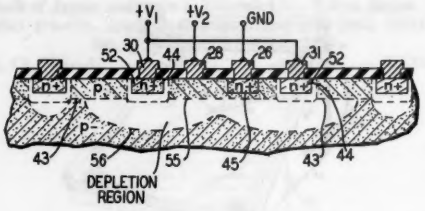
MONOLITHIC INTEGRATED CIRCUIT STRUCTURE

Vincent J. Glinski, Murray Hill, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Dec. 23, 1968, Ser. No. 786,228
Int. Cl. H01l *11/00, 19/00*
U.S. Cl. 317—235 R **2 Claims**

An annular PN junction in conjunction with a relatively high resistivity substrate enables improved means for

isolating functional elements in a monolithic semiconductor integrated circuit. In a semiconductor wafer, localized emitter zones and collector zones extend to a common depth from the surface of the wafer. The collector zone is annular in shape and encloses laterally the emitter zone. The



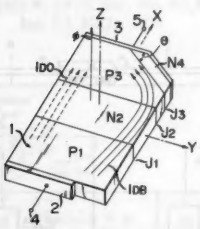
resistivities and spacings of the regions in the wafer are such that with the annular PN junction reverse-biased, the depletion region therefrom extends completely underneath the material enclosed by the annular zone and thereby provides electrical isolation for a functional element in the enclosed material.

3,614,556

MAGNETOSENSITIVE SEMICONDUCTOR SWITCHING DEVICE

Tetsuji Nakamura, Tokyo, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed Apr. 14, 1969, Ser. No. 815,651
Claims priority, application Japan, Apr. 16, 1968, 43/24975
Int. Cl. H01l *11/10*
U.S. Cl. 317—235 R **2 Claims**



A semiconductor device wherein a layer to which is generally connected the gate electrode of an ordinary thyristor and an end layer adjacent thereto are shorted by a common electrode. The PN junction defined between these layers is exposed on one lengthwise end portion of the substrate, and a switching operation is performed by an electromagnetic field instead of the gate current of the thyristor.

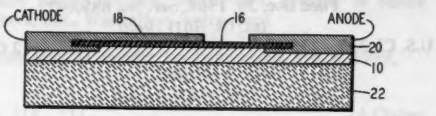
3,614,557

SHIELDED-CATHODE MODE BULK EFFECT DEVICES

Frank R. Holmstrom, Waltham, Mass., assignor to The United States of America as represented by the Administrators of the National Aeronautics and Space Administration

Filed May 16, 1969, Ser. No. 825,258
Int. Cl. H01l *11/00, 15/00*
U.S. Cl. 317—235 R **6 Claims**

"Gunn effect" microwave diodes are disclosed wherein that portion of the semiconductor material in which the direct current field is below the critical value for negative differential conductivity is shielded from applied radio frequency energy. High-conductance RF shielding is applied to the device in such a manner that applied RF fields interact



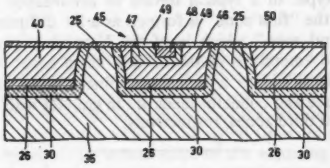
only with the relatively short length portion of the semiconductor material in which the applied DC field is greater than the threshold for negative differential conductivity.

3,614,558

SEMICONDUCTOR DEVICES WITH MORE THAN ONE SEMICONDUCTOR CIRCUIT ELEMENT IN ONE BODY

Claude Jan Principe Frederic Le Can, and Walter Steinmaier, both of Mollenhutseweg, Nijmegen, Netherlands, assignors to U. S. Philips Corporation, New York, N.Y.

Filed Sept. 16, 1965, Ser. No. 487,748
Claims priority, application Netherlands, Sept. 23, 1964, 6411057
Int. Cl. H01l *19/00*
U.S. Cl. 317—235 R **15 Claims**



A solid semiconductor circuit employing a buried metal layer to reduce the series resistance of a semiconductor zone of one of the circuit elements.

3,614,559

BARRIER-FREE SEMICONDUCTOR SWITCHING DEVICE

Max Guntersdorfer, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

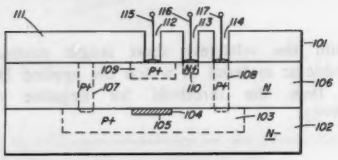
Filed May 27, 1969, Ser. No. 828,199
Claims priority, application Germany, May 27, 1968, P 17 64 373.1
Int. Cl. H01l *9/00*
U.S. Cl. 317—238 **7 Claims**

Described is a barrier-free semiconductor component for switching, having at least two electrodes. The component is characterized by the fact that its semiconductor body is comprised of strontium vanadate with sporadic vanadium oxide inclusions.

3,614,560
SURFACE BARRIER TRANSISTOR

Narasipur G. Anantha, Hopewell Junction, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1969, Ser. No. 889,047
Int. Cl. H011 *19/00*
U.S. Cl. 317—235 R 12 Claims

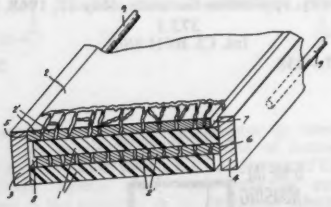


A semiconductor device comprising in combination: a first zone of semiconductive material containing impurity atoms of the acceptor type; a contiguous second zone of semiconductive material containing a predetermined low concentration of impurity atoms of the donor type; a metal layer having an interface with said second zone; and a third zone of relatively highly conductive semiconductive material in contact with said metal layer and containing a high concentration of impurity atoms of either the donor or acceptor type. In a typical device in accordance with this invention the "first zone" is formed as a P+ diffusion area in the "second zone" which is of the N-conductivity type of silicon, the "metal" is platinum, the "third zone" is formed by P+ diffusion into a monocrystalline silicon wafer, and emitter, base and collector leads are in contact with said first, second and third zones, respectively.

3,614,561
ELECTRICAL CONDENSER

Reinhard Behn, Munich; Gerhard Hoyler, Munich, and Hartmut Kessler, Regensburg, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed June 18, 1969, Ser. No. 834,247
Claims priority, application Germany, June 25, 1969, P 17 64 548.6
Int. Cl. H01g *1/13*
U.S. Cl. 317—258 3 Claims

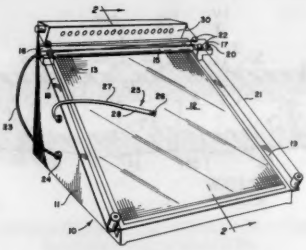


An electrical stack or layer condenser produced by coiling plastic tapes carrying a metal coating on a drum and by dividing the master coil placed on the drum into the desired individual condensers employ stretchable plastic material, polycarbonates, polyethylene, terephthalate, polypropylene as the dielectricum and metallic coatings having a conductivity of less then 1.5 mho. The dividing causes the plastic to shrink away from edge of the capacitor causing a tearing of the metal coating. The torn portion of the metal coating has an oxide coating.

3,614,562
LAMINATING APPARATUS AND METHOD

Anthony Q. Testone, Lansdale, Pa., assignor to Testone Electrostatics Corporation, West Point, Pa.

Filed Oct. 14, 1969, Ser. No. 866,205
Int. Cl. H05 ; G09f *7/02*
U.S. Cl. 317—262 E 18 Claims

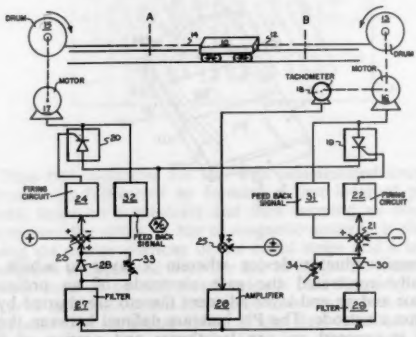


A light box has a glass plate with a grounded conductive sheet on its underside, and a light within the box; a charging bar is moveable above the plate to provide electrostatic clamping of film to the plate, and an ion generator causes ions to flow over the plate to prevent dust from accumulating on the film. A method includes electrostatically adhering a film to a support, positioning art work and a transparent film successively over the first film, and electrostatically adhering the films together while causing a flow of ions over the films and art work to prevent dust adherence to the film.

3,614,563
PLURAL MOTOR TENSION CONTROL FOR A REVERSING INGOT CARRIER SYSTEM

George B. Jones, Schenectady, N.Y., assignor to General Electric Company

Filed Oct. 22, 1968, Ser. No. 769,486
Int. Cl. H02p *7/28*
U.S. Cl. 318—7 3 Claims



A cable-drawn vehicle control wherein the vehicle is arranged to travel between two locations, each location having a motor-operated drum for taking up and supplying lengths of cable, the ends of which are fixed to the vehicle and to the drums with the motors excited from an alternating current source to oppose each other in winding and unwinding the cables. A tachometer is attached to one of the motors for providing a DC speed signal in opposition to a DC speed reference signal of either polarity representing desired speed and direction. A pair of additional DC reference signals having opposing polarity provide a predetermined level of excitation to each of the motors, whereby the tension in the cables maintains the vehicle in stationary condition. With the application of the speed reference signal, additional

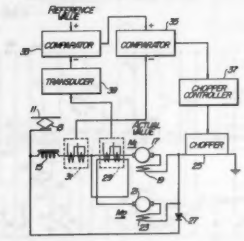
excitation is applied to one of the motors, causing it to override the other motor and move the vehicle, the speed and direction of which is dependent on the magnitude and polarity of the desired speed reference signal.

3,614,564

READHESION APPARATUS FOR VEHICLES

Tetsuji Hirotsu, Katsuta-shi, and Hisao Sonobe, Ibaraki-ken, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Claims priority, application Japan, July 22, 1968, 43/51208
Int. Cl. B61c *15/12*; H02p *5/50*
U.S. Cl. 318—52 **9 Claims**



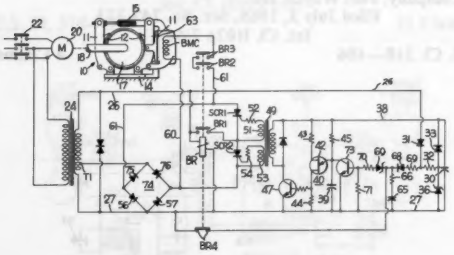
A readhesion apparatus for vehicles for detecting an increment of velocity resulting from a slip caused to a vehicle wheel adapted to make the output of a driving motor follow a reference value, applying the detected value to a transducer which exhibits different time constants when input variation is increasing and when it is decreasing, and reducing the reference value in accordance with an output from said transducer, whereby readhesion of the wheel is enhanced.

3,614,565

CONTROL FOR ELECTROMECHANICAL BRAKE

Robert E. Mierendorf, Greendale, Wis., assignor to Harnischfeger Corporation, West Milwaukee, Wis.

Filed July 9, 1970, Ser. No. 53,505
Int. Cl. H02p *3/04*
U.S. Cl. 318—203 **9 Claims**



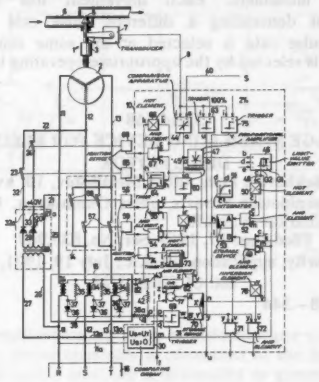
A static brake controller supplies DC operating voltage from a bridge rectifier having SCR's in legs thereof to the brake magnet coil of an electromechanical brake to release the brake. Means including a unijunction relaxation oscillator apply gating pulses to the SCR's. RC timing circuit means disable the unijunction oscillator a predetermined interval after initial energization of the power supply transformer so that the SCR's commutate off, and a second bridge rectifier energized from a reduced voltage tap on the power supply transformer secondary applies normal holding voltage to the brake magnet coil to maintain the brake released, thereby preventing over heating of the brake magnet coil and assuring rapid resetting of the brake when the brake coil is deenergized.

3,614,566

CONTROL DEVICE HAVING MEANS FOR ELECTRICALLY SIMULATING AND COMPENSATING THE INERTIA MOMENTUM OF THE MOVING PARTS OF AN ELECTRICAL POSITIONING MEANS

Ferdinand Konig, Seuzach, Switzerland, assignor to Sulzer Brothers, Ltd., Winterthur, Switzerland

Filed Jan. 28, 1970, Ser. No. 6,530
Claims priority, application Switzerland, Feb. 6, 1969, 186/69
Int. Cl. H02p *3/22*
U.S. Cl. 318—211 **14 Claims**



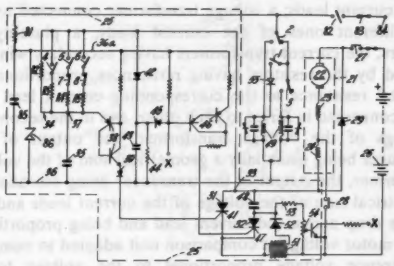
The drive has a switching logic which includes a means for producing a correction signal in response to the switching-in of the motor. This correction signal serves to compensate for the kinetic energy of the moving parts of the drive by moving up the lower limit valve of an error signal (derived from the difference between the actual value of the adjusting element position and a fixed value) so as to permit more accurate switching-out and stopping of the motor. Other features are added to prevent overloading, premature switching-out of the motor during starting, short circuits and the like.

3,614,567

CONTROL OF AUXILIARY MOVEMENTS ON INDUSTRIAL TRUCKS

Ivan Salisbury Payne, and Cecil Goodacre, both of Basingstoke, England, assignors to Lansing Bagnall Limited, Basingstoke, England

Continuation-in-part of application Ser. No. 402,128, Oct. 7, 1964, now abandoned. This application Dec. 22, 1967, Ser. No. 692,849
Claims priority, application Great Britain, Oct. 8, 1963, 13977/63
Int. Cl. H02p *5/16*
U.S. Cl. 318—305 **9 Claims**



An industrial truck having several different auxiliary movements such as a carriage lift mechanism, a mast tilt

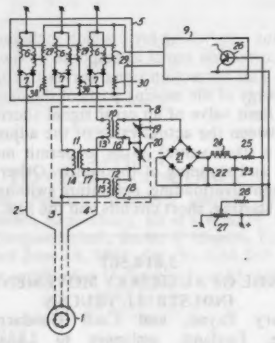
mechanism and a reach mechanism has levers operative to select any one mechanism for operation alternatively. A pulse-controlled motor is provided for giving power to drive any one of the movements. The motor drives a variable speed hydraulic pump which is associated with respective valve mechanisms so that the pump provides hydraulic power to drive a mechanism when the respective valve mechanism is operated. The levers controlling the valve mechanisms are also operative to open or close various switches in a control arrangement for the motor such that when a respective one of the movements is selected the pulse-operated motor is driven at a pulse rate respective to the demands of the particular movement. Each movement has a power requirement demanding a different pulse rate and the required pulse rate is selected at the same time as the movement is selected by the appropriate operating lever.

3,614,568

VOLTAGE STABILIZING DEVICE FOR ELECTRIC DRILL MOTOR

Izrail Mordukhovich Pesis, ulitsa Metallistov, 10, kv. 12, and David Leonidovich Shvarts, ulitsa Olminskogo, 10, kv. 2, both of Kharkov, U.S.S.R.

Filed June 17, 1969, Ser. No. 833,967
Claims priority, application U.S.S.R., July 19, 1971, 1254002
Int. Cl. H02p 5/18
U.S. Cl. 318—344 **4 Claims**



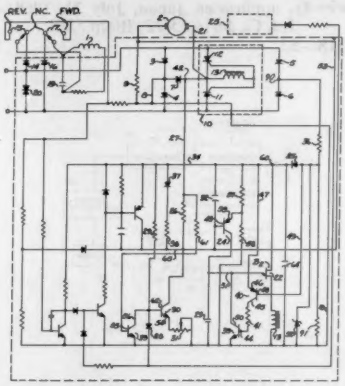
A voltage stabilizing device for an electric drill motor used in a well comprises a voltage control unit provided in the motor connected between a power supply source and current leads of the motor; a voltage transducer in the motor incorporating at least two current transformers having primary winding separately connected to two different ones of the current leads; a voltage transformer connected to the two different ones of the current leads, a plurality of resistors, the current transformers having secondary winding shunted by the resistors having resistances proportional to the total resistance to the corresponding current lead and being connected in series to each other, and to the secondary windings of the voltage transformer, the output of the transducer being essentially a geometrical sum of the voltage transformer, the output of the transducer being essentially a geometrical sum of the voltage of the current leads and the voltage drop across the current lead and being proportional to the motor voltage; a comparison unit adapted to compare a reference voltage proportional to the voltage to be stabilized with the outer voltage of the transducer, the output of the comparison unit being connected to the voltage control unit for controlling the operation of that unit.

3,614,569

DC MOTOR CONTROLLERS WITH IR COMPENSATION FOR EXTENDED SPEED RANGE

Owen E. Reinert, St. Louis, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Oct. 30, 1969, Ser. No. 872,535
Int. Cl. H02p 5/16
U.S. Cl. 318—345 **10 Claims**



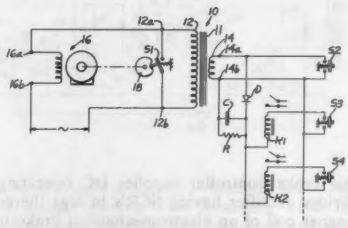
In a standard speed control circuit for DC electric motors, such circuit generally being comprised of an external speed command potentiometer electrically connected to an amplifier, a negative feedback loop indicating motor armature voltage electrically connected to said amplifier, and a positive IR compensation loop electrically connected to said amplifier, which amplifier feeds a signal to a triggering circuit which in turn is electrically coupled to a silicon controlled rectifier circuit, such rectifier circuit being the final resolver of motor speed, means are provided to reduce progressively the effect of the IR compensation input to the amplifier as speed command is increased.

3,614,570

SIMPLIFIED WIRE REMOTE CONTROL OF SMALL MOTORS

Louis F. Mayle, Fort Wayne, Ind., assignor to The Magnavox Company, Fort Wayne, Ind.

Filed July 3, 1968, Ser. No. 742,273
Int. Cl. H02p 7/64
U.S. Cl. 318—486 **4 Claims**



An electric circuit arrangement wherein a load current at a higher voltage can be remotely controlled by a control current at a lower voltage in which the load current passes through a first coil which is magnetically coupled to a second coil in which the control current flows. The magnetic coupling of the coils causes the impedance between the terminals of the second coil to be reflected back to the first coil. When a high impedance is across the terminals of the second coil, a small current, less than that required to activate the load, flows in the first coil whereas upon

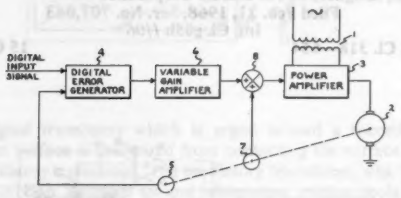
reduction of the impedance across the terminals of the second coil, the current flowing in the first coil rises to load actuating value. The variable impedance across the terminals of the second coil is, advantageously, a switch which is open for the high impedance condition and which is closed for the low impedance condition.

3,614,571

LINEARIZATION OF A DIGITAL PHASE CONTROL POWER AMPLIFIER FOR DYNAMO ELECTRIC MACHINE

Albert F. Koch, Lanesboro, Mass., assignor to General Electric Company

Filed Dec. 16, 1968, Ser. No. 784,096
Int. Cl. H02p *5/10*
U.S. Cl. 318—345 13 Claims



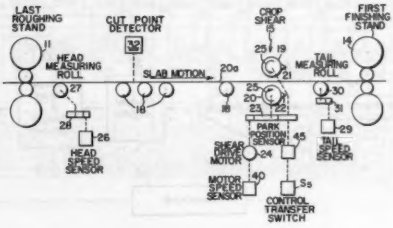
A digital motor control system compensates for the nonlinearity due to operation from a sinusoidal AC power source. A digital error signal is fed through a variable gain digital amplifier whose characteristics are such that the gain varies so as to correct for the nonlinearities which normally result. The output of the variable gain digital amplifier is used to directly control the transfer of power as, for example, by initiating the conduction of controllable rectifiers. The variable gain digital amplifier acts to vary the gain at two different rates, the second rate being less than the first by some factor of two.

3,614,572

AUTOMATIC CONTROL SYSTEM FOR CROP SHEAR

Thomas E. Usher, Scotia, N.Y., assignor to General Electric Company

Filed Mar. 16, 1970, Ser. No. 19,870
Int. Cl. H02p *1/04*
U.S. Cl. 318—396 11 Claims



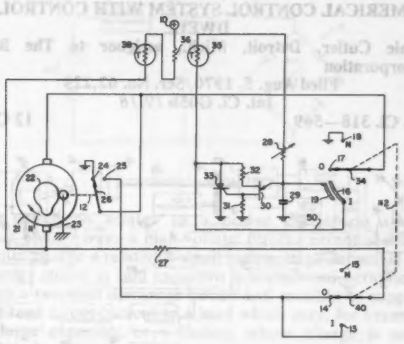
A computer is used to determine the time and position at which a rotary crop shear is started so that the ends of an approaching slab will be cropped at desired crop lines. The computer calculation is based on the principle that the area under the velocity-time profile on the shear equals the distance traveled by the shear blades. A motor speed regulator provides a predictable velocity-time characteristic and a maximum acceleration independent of slab speed to reduce cutting errors. The shear/slab speed ratio is adjustable.

3,614,573

INTERMITTENT CONTROL FOR WINDSHIELD WIPER SYSTEMS

Willis E. Rieman, Skaneateles, and Edward R. Betz, Auburn, both of N.Y., assignors to Gulf & Western Systems Company, New York, N.Y.

Filed Feb. 5, 1970, Ser. No. 9,000
Int. Cl. B60s *1/08*
U.S. Cl. 318—443 10 Claims



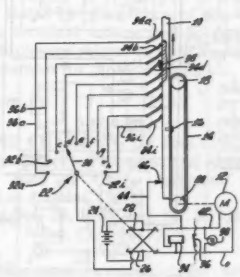
An intermittent control for a windshield wiper system. One of the two motor terminals is connected to the battery and the second motor terminal is connected to ground through the conventional park switch. In parallel with the park switch is a normally off SCR. A relaxation oscillator triggers the SCR to provide a momentary path to ground for the motor current. As soon as the park switch moves to provide a path to ground, the SCR turns off. The charging circuit of the relaxation oscillator includes a thermistor, heat-coupled to a resistance element in the motor circuit, for causing the dwell period to increase with windshield drag. A potentiometer is also provided in the charging circuit to allow manual adjustment of the dwell period. An additional thermistor in the motor circuit, also heat-coupled to the resistance element, causes the motor speed to slow down as the drag on the wiper blades increases. A circuit is provided for causing the SCR to turn on immediately when the control switch is operated, thus initiating a wipe cycle immediately independent of the operation of the relaxation oscillator.

3,614,574

REVERSIBLE FOLLOW UP POSITIONING DEVICE FOR MOBILE ANTENNA STRUCTURES OR THE LIKE

Hato R. Hodges, 169 Horizon Lane, Rancho Calevero Mobile Park, and Fred J. Schnell, 97 Blue Sky Lane, Rancho Calevero Mobile Park, both of Oceanside, Calif.

Filed Feb. 16, 1970, Ser. No. 11,368
Int. Cl. G05b *11/14*
U.S. Cl. 318—467 8 Claims



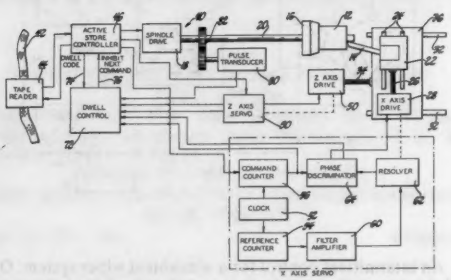
A selector switch is movable between limits through a number of stations corresponding to desired positions of the

load. When the selector switch is moved in one direction or the other to a different station, the reversible motor is automatically connected to move in the required direction and automatically to stop when the load arrives at the selected station. This is accomplished by a two-state sensor that responds to the direction of movement of the selector switch.

3,614,575
NUMERICAL CONTROL SYSTEM WITH CONTROLLED DWELL

Hymie Cutler, Detroit, Mich., assignor to The Bendix Corporation

Filed Aug. 5, 1970, Ser. No. 62,229
Int. Cl. G05b *19/18*
U.S. Cl. 318—569 **12 Claims**

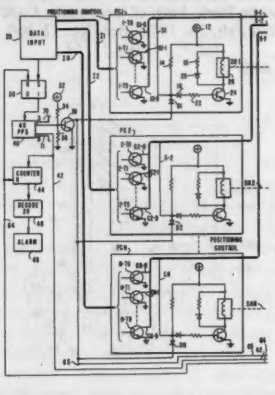


A numerical control system for a lathe includes means for inhibiting the execution of one of a series of commanded motions until the previous command has been acted on for a sufficient time to insure its execution. The system measures the error between the actual and commanded positions of the controlled part by comparing the phase displacement between the reference and command square waves in a phase analog servo. When the command-position error reaches a predetermined minimum value, indicating that the cutter is very close to its commanded position, pulses generated upon each incremental rotation movement of the spindle are counted until a number has been reached indicating one full spindle revolution. At that point the inhibition of the subsequent command is removed.

3,614,576
PRINT WHEEL POSITIONING SYSTEM

Martin Raphael, New York, N.Y., assignor to Dytro Corporation, Hicksville, N.Y.

Filed Dec. 8, 1969, Ser. No. 883,219
Int. Cl. G05b *11/32*
U.S. Cl. 318—625 **14 Claims**

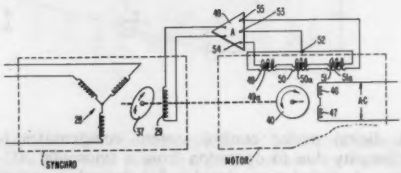


A print wheel positioning system. A stepping circuit is associated with each print wheel, and a common step/sense line is extended to each stepping circuit. The step/sense line is normally grounded. In order to advance the print wheels by one position, the step/sense line is ungrounded; this causes each stepping circuit associated with an improperly positioned print wheel to advance the print wheel and to apply a positive potential to the step/sense line. As soon as a wheel is positioned correctly, the ungrounding of the step/sense line has no effect on the respective stepping circuit. As long as at least one print wheel has not yet been properly positioned, the step/sense line goes positive each time it is ungrounded. As soon as all print wheels are properly positioned, the step/sense line does not go positive when it is ungrounded and a print command is generated.

3,614,577
SYNCHRO-SERVOMOTOR COMBINATION

Charles C. Honeywell, and Louis H. Voige, both of Montrose, Pa., assignors to The Bendix Corporation

Filed Feb. 21, 1968, Ser. No. 707,043
Int. Cl. g05b *1/06*
U.S. Cl. 318—654 **15 Claims**

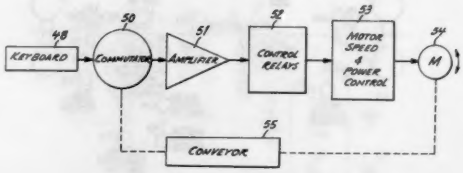


A synchro electrical signal generator or rotary control transformer in combination with an induction servomotor, said transformer and motor having a common rotor shaft.

3,614,578
CLOSED LOOP ON-OFF CONTROL SYSTEM FOR DC MOTORS INCLUDING DYNAMIC BRAKING

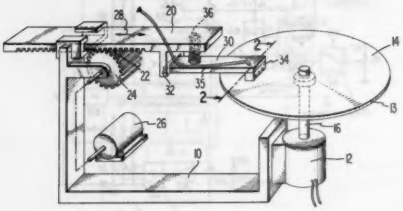
Benjamin W. Woodward, Kenmore, and John J. Allard, Buffalo, both of N.Y., assignors to Sherry Rand Corporation, New York, N.Y.

Filed Dec. 22, 1969, Ser. No. 886,887
Int. Cl. G05b *11/14*
U.S. Cl. 318—673 **10 Claims**



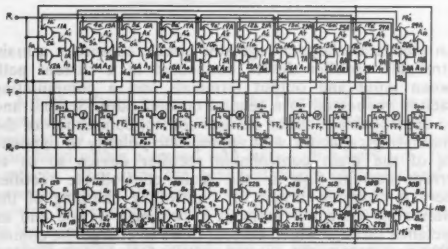
A network of electronic circuitry elements connected to form a system for controlling a DC motor. The principles of dynamic braking are applied in an arrangement adapted to perform several control functions, during which the motor becomes a self-excited generator dissipating stored energy in braking elements connected across the armature via various paths. Selection of the current path through the braking elements is controlled by condition responsive devices included in the system.

3,614,579
SQUEEZE FILM BEARING SERVOSYSTEM
Langdon Hollister Fulton, Wynnewood, Pa., assignor to RCA
Filed Sept. 24, 1970, Ser. No. 75,012
Int. Cl. G05b *11/01*
U.S. Cl. 318—676 7 Claims



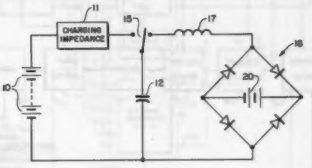
A signal transducer which is urged toward a recording medium surface is prevented from contacting the surface by an oscillatory transducer. The oscillatory transducer, which is direct motion coupled to and alternating motion isolated from the signal transducer, is positioned adjacent the recording medium surface and caused to oscillate in a direction transverse to the surface, which creates a pressurized air film to hold the transducers away from the recording medium surface. The amplitude at which the oscillatory transducer is driven, which may be controlled by a servosystem, determines the distance of the signal transducer from the recording medium surface.

3,614,580
PULSE MOTOR DRIVE SYSTEMS
Kunihiko Eto, Kariya-shi, Japan, assignor to Toyoda Koki Kabushiki Kaisha, Aichi-ken, Japan
Filed Dec. 29, 1969, Ser. No. 888,644
Claims priority, application Japan, Dec. 29, 1968, 44/795
Int. Cl. G05b *19/40*
U.S. Cl. 318—696 4 Claims



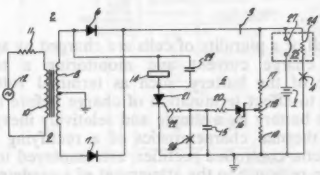
The pulse motor drive system comprises a plurality of flip-flop circuits connected in an endless chain, each of the flip-flop circuits including a pair of input terminals and a pair of output terminals. At least one output terminal of each flip-flop circuit is connected to the input terminals of the flip-flop circuits on both sides thereof through gate circuits. The initial state of output signals for output terminals of all flip-flop circuits are determined by a reset signal and the state thus determined is shifted one by one by trigger pulses. Output conductors are connected between output terminals of every other flip-flop circuits and a conventional pulse motor to energize coils thereof in a predetermined order.

3,614,581
POWER CONVERSION SYSTEM
Emerson L. Frost, Manasquan, N.J.
Filed Feb. 10, 1970, Ser. No. 10,166
Int. Cl. H02j *7/00*
U.S. Cl. 320—6 5 Claims



This invention relates to a power conversion system wherein energy from a high-voltage direct current source is caused to charge a relatively small high-voltage capacitor and the energy stored in said capacitor is transferred periodically through a resonant discharge circuit and rectifier to supply a low-voltage direct current to a load which may, for example, be a large capacitor or a battery whose charge is to be maintained relatively constant.

3,614,582
RAPID CHARGING OF BATTERIES
Wilford B. Burkett, Pacific Palisades, and John H. Bigbee, III, Los Angeles, both of Calif., assignors to McCulloch Corporation, Los Angeles, Calif.
Continuation of application Ser. No. 726,060, May 2, 1968.
This application July 13, 1970, Ser. No. 54,244
Int. Cl. H02j *7/10*
U.S. Cl. 320—5 20 Claims

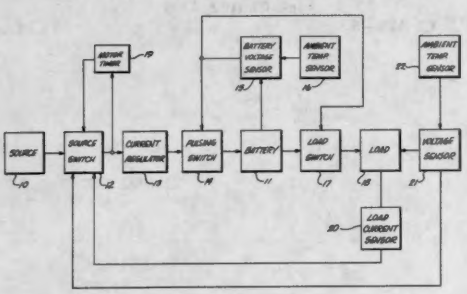


A battery is charged in a very short period of time by applying a charging current in excess of the nominal 1-hour rate of the battery, with the charging current decreasing as the battery becomes charged. The charging current is intermittently interrupted in response to the attainment of a predetermined voltage by integrating the battery terminal voltage, and the battery is discharged at a high rate for a short period of time. The frequency of the interruptions is increased as the terminal voltage and charge of the battery increases. The disclosure relates to both the method of rapid charging and apparatus for rapid charging.

3,614,583
RAPID CHARGING OF BATTERIES
Wilford B. Burkett, Pacific Palisades, and Robert V. Jackson, Los Angeles, both of Calif., assignors to McCulloch Corporation, Los Angeles, Calif.
Filed Oct. 20, 1969, Ser. No. 867,838
Int. Cl. H02j *7/10*
U.S. Cl. 320—5 33 Claims

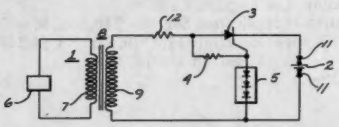
Batteries, having one or more cells, are charged by applying a charging current, either continuous direct current or pulsating direct current, having an average value during flow in excess of the nominal 1 hour rate of the cells as rated by the manufacturer. The batteries are intermittently discharged to depolarize the battery to enhance the

chargeability of the battery. This discharging is at a rate also in excess of the nominal 1 hour rate, with the occurrence of



the discharging being dependent upon the occurrence of a selected value of either battery terminal voltage, battery pressure, or battery temperature, one of which is monitored.

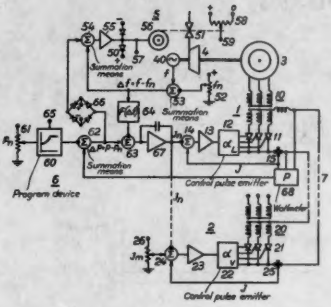
3,614,584
TERMINATION OF BATTERY CHARGING
Wilford B. Burkett, Pacific Palisades, and John H. Bigbee, III, Los Angeles, both of Calif., assignors to McCullock Corporation, Los Angeles, Calif.
Filed Mar. 20, 1970, Ser. No. 21,430
Int. Cl. H02j 7/10
U.S. Cl. 320—35 **14 Claims**



A single cell or a plurality of cells are charged by applying a high-rate charge current and monitoring a terminal characteristic of the battery, such as terminal voltage or temperature, to effect termination of charge before damage occurs to the battery by a simple and relatively inexpensive circuit. The thermal characteristics of a rectifying means, such as a silicon controlled rectifier, are employed to effect termination in response to the attainment of a predetermined terminal characteristic by employing, for example, a circuit that clamps the control terminal of the rectifying means at a selected voltage, thereby making the charger sensitive to battery terminal voltage or a circuit that includes a thermistor mounted in thermal proximity with the battery and electrically connected between the control terminal of the rectifying means and the negative terminal of the battery, which makes the charger sensitive to battery temperature.

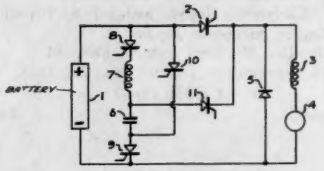
3,614,585
CENTRAL POWER PLANT FOR FEEDING DC POWER TRANSMISSION PLANT
Kurt Wedin, Norrviken, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden
Filed Dec. 15, 1969, Ser. No. 884,979
Claims priority, application Sweden, Dec. 16, 1968, 17173/68
Int. Cl. H02m 5/40
U.S. Cl. 321—2 **5 Claims**

A power station is provided with a power machine driving an AC generator for feeding an HVDC power transmission plant, comprising a rectifier station in the power station and an inverter station at the other end of an HVDC line connected to the rectifier station. The power machine is controlled from a machine regulator to provide a desired rotational speed, while the converter stations of the HVDC transmission plant are controlled from a converter regulator to maintain a desired transmission magnitude. The machine regulator and the converter regulator are mutually connected and coordinated so that, in the first place, a change in the state of control of the HVDC plant is fed to the input of the machine regulator and, in the next place, a deviation between the state of control of the power machine and the



actual number of turns of this machine influences the converter regulator so that the state of control of the converters is temporarily adapted to that of the power machine.

3,614,586
ELECTRICAL CHOPPER REGULATOR CIRCUITS
Kenneth G. King, London, England, assignor to Westinghouse Brake and Signal Company, Limited, London, England
Filed Dec. 29, 1969, Ser. No. 888,384
Claims priority, application Great Britain, Jan. 13, 1969, 01833/69
Int. Cl. H02m 3/32
U.S. Cl. 321—2 **6 Claims**

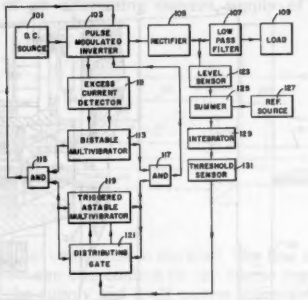


An electrical chopper regulator circuit comprises a main controllable rectifier device connected in a current path between input and output terminals and a commutating capacitor connected in a second current path. Second and third controllable rectifier devices control connection of the commutating capacitor with appropriate polarity to opposite sides of the main controllable rectifier device so as to interrupt current flow in the main controllable rectifier device. A charging circuit for controlling charging of the commutating capacitor includes a switching device and an inductance through which current flows to charge the commutating capacitor to the correct polarity for commutating the main controllable rectifier device before firing of that device.

3,614,587
SATURATION CURRENT PROTECTION APPARATUS FOR SATURABLE CORE TRANSFORMERS
Francis C. Schwarz, Weston, Mass.
Division of Ser. No. 775,870, Nov. 14, 1968, Pat. No. 3,539,905.
Filed July 1, 1970, Ser. No. 60,202
Int. Cl. H02m 7/52; H02p 7/14; G05f
U.S. Cl. 321—2 **7 Claims**

This disclosure describes a saturation current protection apparatus for saturable core transformers. A cut core (airgap) transformer detects the occurrence of rapidly increasing magnetic current in the saturable core transformer. When a rapidly increasing current condition

occurs, the cut core transformer applies a suitable signal to a switching means. The switching means terminates the



application of current to the saturable core transformer to protect it from an undesirable over current condition

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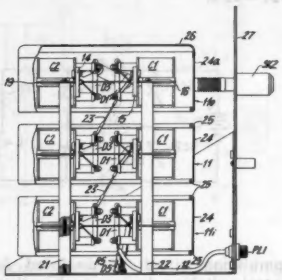
3,614,588

ELECTRIC HIGH VOLTAGE GENERATORS

Alan Davies, Wantage, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed July 9, 1970, Ser. No. 53,389
Claims priority, application Great Britain, July 18, 1969, 36418/69
Int. Cl. H02m 7/00
U.S. Cl. 321—8 R **8 Claims**



A high voltage generator of the Cockcroft-Walton type is constructed from modular units built up into a stack, the number of units determining the voltage. Each unit is contained within a screen with large radius outwardly facing surfaces. The units are ready stressed internally and the screens ease the stressing problems of building up a stack. A driving inverter of the switched thyristor type has inductance in the overflow diode path so that the inverter will withstand a short across the output and to improve the speed of thyristor recovery.

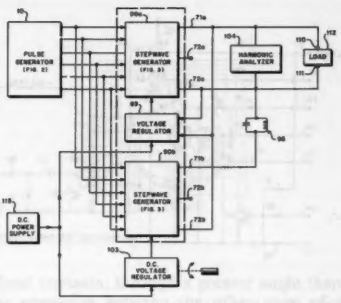
3,614,589

SINE WAVE STATIC INVERTER

Ralph H. Ireland, Warminster, Pa., and Joseph D. Segrest, Cherry Hill, N.J.

Filed Mar. 18, 1970, Ser. No. 20,701
Int. Cl. H02m 1/12
U.S. Cl. 321—9 A **8 Claims**

A sine wave static inverter produces a sine waveform from the output of a step wave generator by removing the higher harmonics from a step waveform. A first embodiment short circuits the higher harmonic signals across the secondary winding of a transformer thus permitting only the first harmonic sine wave to reach the output. A second embodiment applies only higher harmonic signals from a generated step waveform 180° out of phase with a second



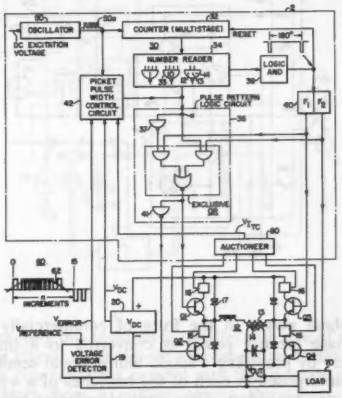
generated step waveform so that only the first harmonic of the second step waveform appears at the output.

3,614,590

PROGRAMMED WAVEFORM STATIC INVERTER FOR DIGITALLY GENERATING AC WAVEFORMS COMPRISED OF A PATTERN OF EQUAL WIDTH VOLTAGE PULSES

Andress Kernick, Lima, Ohio, assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 19, 1969, Ser. No. 825,807
Int. Cl. H02m 1/12, 7/52; H02h 7/14
U.S. Cl. 321—9 **25 Claims**



The invention comprises a solid-state static inverter utilizing digital means for generating AC waveforms comprising a pulse-width modulated pattern of a plurality of picket pulses, wherein each picket pulse of a waveform is defined within an identical number of equal increments of the waveform half cycle.

3,614,591

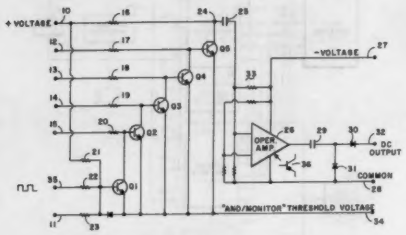
FAILSAFE AND-MONITOR CIRCUIT

James L. Brown, Marion, Iowa, assignor to Collins Radio Company, Cedar Rapids, Iowa

Filed Mar. 27, 1970, Ser. No. 23,151
Int. Cl. H02m 1/08; G06g 7/00
U.S. Cl. 321—16 **11 Claims**

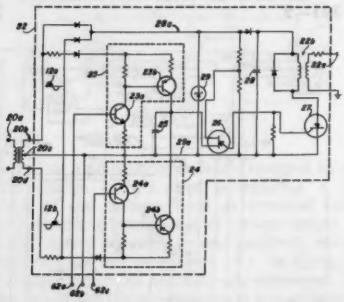
A circuitry which develops an output of a predetermined DC polarity in response to all of a plurality of input lines exhibiting voltage levels in excess of a threshold level. Should at least one of the input lines fall beneath threshold or the monitoring circuitry itself fail a second output level of

opposite polarity is developed. The monitored inputs act as supply voltages for a transistor switching chain to which a square wave tracer input is applied. The output from the chain is a square wave at the tracer PRF only if the circuitry



is operational and the inputs are above threshold. Output circuitry is responsive only to a square wave applied from the chain to develop the output level assigned to indicate valid output logic.

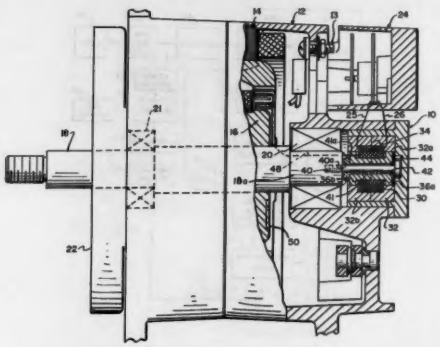
3,614,592
CYCLOCONVERTER USING BIDIRECTIONAL SEMICONDUCTOR SWITCHES
John T. Redfern, La Jolla, Calif.
Filed Nov. 18, 1969, Ser. No. 877,721
Int. Cl. H02m *5/30*
U.S. Cl. 321—69 R **1 Claim**



Polyphase power in the form of commercially available three-phase electric power is converted to a single lower frequency by providing a single bidirectional semiconductor serially interposed in each of the branches of a wye or delta transformer secondary. Gate control unipolar trigger pulses are produced when polarity coincidence occurs between the component of polyphase power appearing across each of the branches and a control frequency having its frequency lower than that of the polyphase power. Selective gating of each bidirectional semiconductor forms a composite signal across a commonly connected load in accordance with the frequency of a control signal.

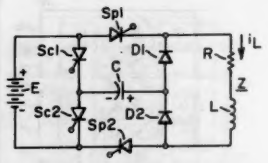
3,614,593
ROTARY TRANSFORMER FOR ALTERNATOR
Melvin A. Lace, Prospect Heights, Ill., assignor to Motorola, Inc., Franklin Park, Ill.
Filed May 6, 1970, Ser. No. 34,987
Int. Cl. H02p *9/38*
U.S. Cl. 322—28 **8 Claims**

An alternator having a stator winding for applying alternating current voltage to output terminals thereof has a rotor rotatably mounted therein adjacent the stator to induce the alternating current voltage into the stator. A rotary transformer secured to one end of the rotor shaft has a rotary secondary winding and a core thereof in axial alignment with the rotor shaft and includes a single wire connection between the rotary secondary winding and the alternator rotor



winding to transfer the excitation voltage induced in the secondary of the rotary transformer into the rotor winding.

3,614,594
FORCE COMMUTATION CIRCUITS
John Ross, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Continuation-in-part of application Ser. No. 813,074, Apr. 3, 1969, now abandoned. This application Mar. 11, 1970, Ser. No. 18,412
Int. Cl. H02m *7/48*
U.S. Cl. 321—45 R **14 Claims**



A commutation circuit is disclosed for commutating power-control switching devices, such as thyristors or silicon-controlled rectifiers, utilized for supplying a load from a DC source, wherein a commutating capacitor is operatively connected across the power control switching device to be commutated by selectively turning on commutation-controlled switching devices, which may also comprise thyristors or silicon-controlled rectifiers. Also unidirectional devices are employed to provide a circuit path for any reactive energy trapped in the load circuit during the commutation operation.

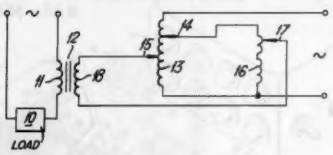
ERRATUM

For Class 322—28 see:
Patent No. 3,614,593

3,614,595
A.C. VOLTAGE CONTROL APPARATUS
Robert Stewart Paulden, Stockport, England, assignor to Ferranti, Limited, Hollinwood, England
Filed Jan. 29, 1970, Ser. No. 6,696
Claims priority, application Great Britain, Feb. 12, 1969, 7523/69
Int. Cl. G05f *3/04*
U.S. Cl. 323—6 **4 Claims**

Alternating current voltage control apparatus comprises a coarse and a fine voltage regulator feeding the primary

winding of a buck/boost transformer the secondary of which is connected in series with a load. The coarse voltage regulator has two movable contacts capable of passing one another, and has the ends of the winding connected to the two poles of an alternating current supply of the same



frequency as that connected to the load. The fine regulator is connected between one contact on the coarse regulator and one pole of the supply and itself carries a movable contact. The primary of the buck/boost transformer is connected between the other movable contact on the coarse voltage regulator and the movable contact on the fine regulator.

3,614,596

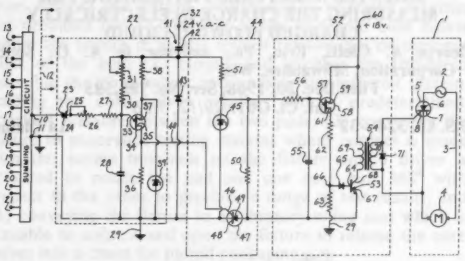
CONTROLLED RECTIFIER FIRING CIRCUIT

David E. Ford, Jr., Milwaukee, and Richard W. Waltz, New Berlin, both of Wis., assignors to Allen-Bradley Company, Milwaukee, Wis.

Filed Feb. 6, 1970, Ser. No. 9,213

Int. Cl. G05f *1/44*

U.S. Cl. 323—22 T **7 Claims**



A summing circuit generates a DC command signal with magnitude proportional to the desired power to be conducted by a power SCR in a motor circuit. A unijunction transistor phase shift circuit receives the command signal and translates its magnitude to a firing angle by connecting the base circuit to an AC reference signal source and the emitter to a capacitor charged by the command signal and the AC reference signal. A sensitive SCR connected to the AC source is fired by the unijunction transistor to charge a capacitor of an oscillator, the output of which is amplified and transformer coupled to the gate of the power SCR.

3,614,597

TAPCHANGERS FOR REGULATING TRANSFORMERS

Gerardus A. Van Riemsdijk, Nijmegen, Netherlands, assignor to Smit Nijmegen Electrotechnische Fabrieken N.V., Nijmegen, Netherlands

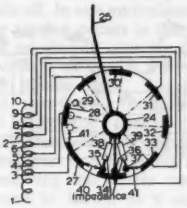
Filed Sept. 24, 1969, Ser. No. 860,630

Claims priority, application Netherlands, Oct. 2, 1968, 6814063

Int. Cl. H02p *13/06;* **H01h** *19/58, 21/78*

U.S. Cl. 323—43.5 R **9 Claims**

A tapchanger for a regulating transformer includes a rotatable combined diverter switch tap selector, of which the fixed contacts are arranged in a circular row and are mounted at equal free distances from each other and at least one fixed contact extends over a larger arc of a circle than the other contacts and in which a set of switching contacts mounted for rotation about the axis of the circular row and cooperating with the fixed contacts is adapted to be rotated, for the changeover operation between at least one pair of



adjacent fixed contacts, through a greater angle than for the changeover operation between the other pairs of adjacent fixed contacts.

3,614,598

CIRCUIT ARRANGEMENT FOR CONVERTING A RESISTANCE VARIATION INTO A PROPORTIONAL ADMITTANCE VARIATION

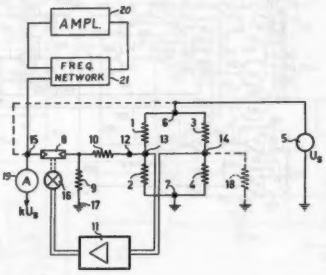
Dietrich Meyer, Hamburg, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 13, 1970, Ser. No. 36,715

Claims priority, application Germany, May 14, 1969, P 19 24 783.7

Int. Cl. G01r *17/14*

U.S. Cl. 323—75 N **9 Claims**



By connecting two resistors in parallel with one of the arms of a bridge circuit, for example a strain-gauge bridge, and by injecting a compensating current into the junction point of these resistors from a voltage source through a variable resistor, the bridge unbalance to be measured is compensated. For this purpose null amplifier which controls the variable resistor is connected to the measuring diagonal arm of the bridge. A small resistance variation in the bridge is converted, with a high degree of accuracy, into a large admittance variation which can be measured at the supply terminal of the variable resistor.

3,614,599

THREE-PHASE DELTA-CONNECTED VOLTAGE-REGULATING SYSTEM AND METHOD THEREFOR

Thomas C. Gmuer, South Britain, Conn., assignor to The Superior Electric Company, Bristol, Conn.

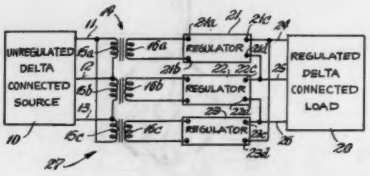
Filed Sept. 17, 1970, Ser. No. 73,141

Int. Cl. H02m *5/10;* **H02p** *13/04*

U.S. Cl. 323—44 **8 Claims**

A system and method for regulating the voltage from a three-phase delta-connected source to a three-phase delta-connected load circuit that includes a voltage regulator for each phase with the input to each regulator being made to be conductively independent of the other phases, while the

outputs of the regulators are interconnected into a three-phase delta connection with each regulator thereby being



essentially unaffected by the power controlled in the other phases.

3,614,600

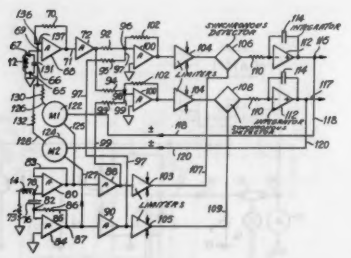
ELECTROMAGNETIC PROSPECTING APPARATUS FOR DETECTING ELECTRICALLY OR MAGNETICALLY RESPONSIVE ORE BODIES

Vaino Ronka, Don Mills, Ontario, Canada, assignor to Geonics Limited, Toronto, Ontario, Canada

Continuation-in-part of application Ser. No. 632,656, Apr. 21, 1967, now Patent No. 3,500,715. This application July 31, 1969, Ser. No. 846,424

Int. Cl. G01v *3/12, 3/16*

U.S. Cl. 324—4 **14 Claims**



Electromagnetic prospecting apparatus which may be used in an airplane for detecting electrically conductive buried ore bodies when they are intersected by a horizontal primary electromagnetic field. The prospecting apparatus includes a receiving, or pickup, coil and a reference coil, preferably orthogonal to the receiving coil, and apparatus for detecting real and quadrature components of voltages which are induced in the pickup coil due to the presence of vertical secondary field components which emanate from the buried ore bodies when they are intersected by the horizontal primary field. The detection is accomplished independent of the strength of the primary field or its frequency and is particularly adapted for prospecting with interrupted or frequency shifted types of primary fields.

3,614,601

APPARATUS FOR GAGING THE LOCATION OF CONTACT POINTS OF SWITCH-COVER ASSEMBLIES

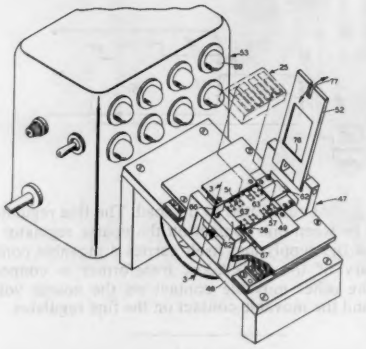
Edward A. Heckman, Allentown, and James O. Hinkle, Emmaus, Edgar H. Walls, Allentown, all of, Pa., assignors to Western Electric Company, Incorporated, New York, N.Y.

Filed Apr. 24, 1969, Ser. No. 818,938

Int. Cl. G01r *31/02*

U.S. Cl. 324—28 R **6 Claims**

Contact pads of a conductive material are deposited on an insulating substrate by thin-film techniques. The contact pads are of such a size and in such a position as to define the limits of operation of contact points of a multislide switch. An apparatus utilizing the substrate and contact pads reveals



those slide switches whose contact points fall within and without desired limits.

3,614,602

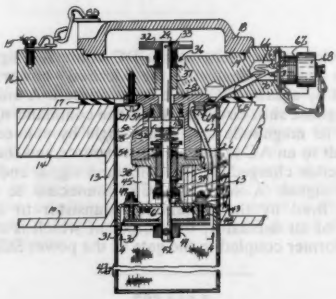
MEASURING APPARATUS INCLUDING ROTATABLY MOUNTED APERTURED PLATE MEANS FOR MEASURING THE CHARGE IN ELECTRICALLY CHARGED FLOWING LIQUID

George A. Ciotti, Erie, Pa., assignor to A. O. Smith Corporation, Milwaukee, Wis.

Filed Dec. 20, 1968, Ser. No. 785,585

Int. Cl. G01r *29/12, 5/28*

U.S. Cl. 324—32 **14 Claims**



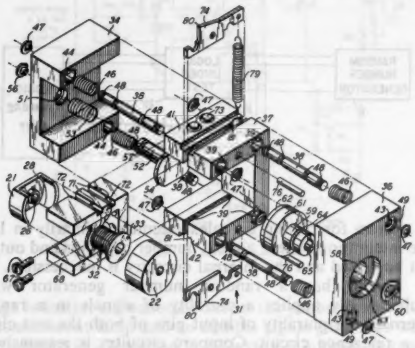
The present disclosure relates to an apparatus for measuring the charge in a flowing liquid. A pair of apertured metal discs are coaxially mounted adjacent to the peripheral portion of the main liquid stream. One disc is driven from a synchronous motor to provide an electrostatic charge-sensing device. The motor contained in an explosion proof housing, is releasably coupled to the disc assembly and includes a switch housing. A reed switch is disposed within the switch housing with an actuating permanent magnet axially spaced from the switch. A shutter is interconnected to the motor-driven shaft and extends between the switch and the magnet. The configuration of the shutter corresponds to an apertured disc. The reed switch connects the discs in an output circuit.

3,614,603

APPARATUS FOR TESTING SEPARABLE MAGNETIC CORES AT VARYING POSITIONS TO ONE ANOTHER

Allen N. Martin, and John L. Speas, both of Winston-salem, N.C., assignors to Western Electric Company, Incorporated, New York, N.Y.

Filed Sept. 29, 1969, Ser. No. 861,572
Int. Cl. G01r 33/12
U.S. Cl. 324—34 R 12 Claims



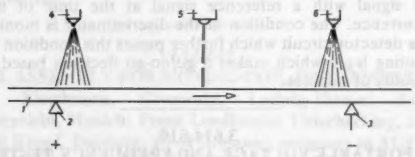
A closable test fixture for paired ferrite cores includes (1) a test coil supported within the fixture and connected to terminals accessible from without the fixture, (2) a spring-loaded pad and (3) a rotatable pad having a shaft accessible from without the fixture. Automatically operated facilities are provided for: (1) loading a pair of ferrite core halves within the fixture in axially spaced relationship on opposite sides of the coil; (2) closing and latching the fixture to assemble the core halves and enclose the test coil therein, holding the core halves together with a predetermined, constant pressure between the two pads; (3) conveying the fixture to successive testing stations where contact is made with the access terminals on the fixture and a driver is actuated to rotate the pad and one core half 360° with respect to the other to produce a range of test results; and (4) conveying the fixture to a vibratory swing nest which is actuable to unlatch and open the fixture to release the core halves into a chute for paired packaging.

3,614,604

METHOD AND APPARATUS FOR DETECTING WORKPIECE SURFACE DEFECTS AND FOR FIXING THE LOCATION THEREOF USING MAGNETIC PARTICLES

Kurt Reinshagen, Ottweiler/Saar, Germany, assignor to Elektrodenfabrik Oerlikon Buhrle AG, Zurich, Switzerland

Filed Oct. 31, 1969, Ser. No. 873,043
Claims priority, application Switzerland, Nov. 8, 1968, 16709/68
Int. Cl. G01r 33/12
U.S. Cl. 324—38 8 Claims



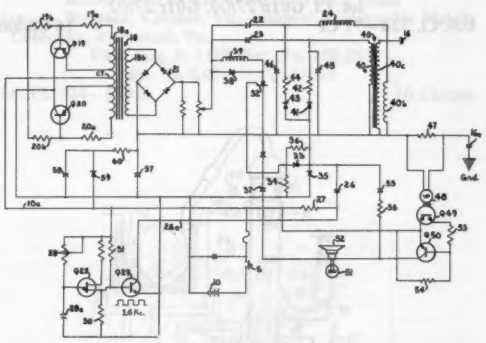
A novel method and apparatus for detecting workpiece surface defects is disclosed. In accordance with the invention, the workpiece is magnetized and a ferritic powder is sprayed over the surface thereof. Due to stray flux lines of the magnetic field occurring at the surface defects, the ferritic powder accumulates at such defects and effectively traces the same, rendering the defect visible. The tracing of the defects is then fixed or preserved automatically so that the defects remain visible for subsequent corrective maintenance operations after the workpiece is demagnetized and the powder falls off. In one embodiment of the invention, the "fixing" of the tracing occurs in that a colored marking material is applied or sprayed over the surrounding surface about the traced defects as well as over the ferritic powder which effects the tracing itself. The workpiece is then demagnetized and the ferritic powder and the colored marking material over the powder is removed. The remainder of the surface, however, remains dyed by the colored marking material thus outlining the surface defects and fixing or preserving the visible tracing thereof. This technique is referred to herein as a so-called "negative" process. In an alternative embodiment of the invention, a "positive" process is employed wherein the ferritic powder which traces the surface defects is permanently adhered to the surface by means of the application of heat. Subsequently, the workpiece is demagnetized leaving the permanently adhered ferritic powder at the defect location thus fixing the visible tracing.

3,614,605

HOLIDAY DETECTOR UTILIZING STAGGERED CAPACITOR DISCHARGES FOR PRODUCING A FAST RISE TIME HIGH-VOLTAGE PULSE

Charles W. Elsele, Warminister, Pa., assignor to H. C. Price Co., Bartlesville, Okla.

Filed Aug. 22, 1969, Ser. No. 852,262
Int. Cl. G01r 31/12
U.S. Cl. 324—54 17 Claims



An electrical detector operable to detect holidays or defects in insulating coatings or mastic coatings generally applied to pipelines has a portable DC power supply, a DC to DC converter, an energy storing means operable to store energy from the DC converter, and SCR interconnected with the energy storing means, an oscillator means for gating the SCR on to discharge the energy storing means through a double primary pulse transformer to produce a high voltage, fast time pulse on an exploring electrode, and an alarm circuit capable of audibly and/or visually indicating that a high voltage has arced through the pipeline coating at a holiday point.

3,614,606

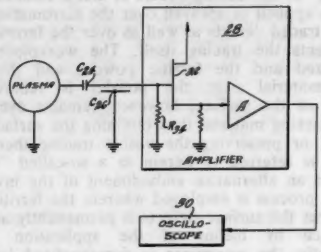
CAPACITIVE-COUPLED PROBE FOR MEASURING POTENTIALS IN A PLASMA

John A. Schmidt, Middleton, and Donald W. Kerst, Madison, both of Wis.

Filed Apr. 4, 1969, Ser. No. 813,449
Int. Cl. G01v 27/26
U.S. Cl. 324—61 R 2 Claims

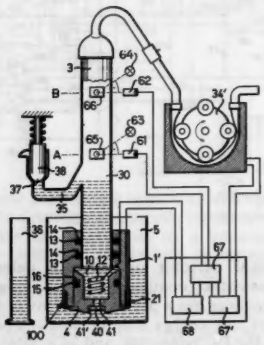
A capacitive-coupled probe includes an elongated glass tube closed at one end thereof and an electrode mounted within the glass tube at the closed end. A conductor extends

within the tube along the length thereof to contact the electrode and a shield is disposed about the conductor with a dielectric material interposed of the shield and the conductor



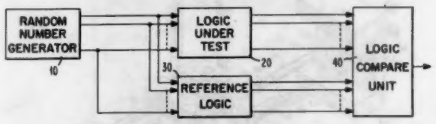
for insulation purposes. The conductor and electrode are sized with respect to the interior of the tube to restrain relative motion therebetween.

3,614,607
PARTICLE COUNTING APPARATUS
Kurt Schoen, Zurich, Switzerland, assignor to Contraves AG, Zurich, Switzerland
Filed Mar. 17, 1969, Ser. No. 807,853
Claims priority, application Switzerland, Apr. 5, 1968, 5140/68
Int. Cl. G01n *27/00*; G01r *27/02*
U.S. Cl. 324—71 CP **16 Claims**



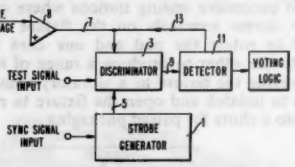
There is disclosed an apparatus for counting particles suspended in a fluid medium the electrical conductivity of which is different from that of the particles. A quantity of this fluid medium containing the suspended particles is delivered by a conveying system from a container or the like through an electrical resistance measuring path. Each particle upon passing through the electrical resistance measuring path causes a change in the resistance of such measuring path which is dependent upon the size of the particles. According to an important aspect of the invention, an electrode support means is mounted in sealing fashion upon or at an exchangeable measuring tube and there is exchangeably mounted at such electrode support means a measurement path support member providing at least one such electrical resistance measuring path.

3,614,608
RANDOM NUMBER STATISTICAL LOGIC TEST SYSTEM
Gary R. Giedd, Wappingers Falls; Gerald A. Maley, Fishkill, and Merlyn H. Perkins, Hopewell Junction, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed May 19, 1969, Ser. No. 825,870
Int. Cl. G01r *15/12*
U.S. Cl. 324—73 R **9 Claims**



A system for testing complex circuitry primarily in large scale integration, where a great number of inputs and outputs must be tested and the internal circuitry is inaccessible. The test system has a random number generator which simultaneously applies a plurality of signals in a random pattern to the plurality of input pins of both the test circuit and a reference circuit. Compare circuitry is responsive to signals received from the test and reference circuits and provides an error signal when the two outputs are not matched.

3,614,609
GO/NO-GO TIMES CIRCUIT USING A TUNNEL DIODE TO SAMPLE A TEST WAVEFORM
Stanley J. Grubel, Wappingers Falls, and Hugh R. Stirling, Poughkeepsie, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Apr. 10, 1970, Ser. No. 27,341
Int. Cl. G01r *19/00*; H03k *17/58*
U.S. Cl. 324—77 A **3 Claims**

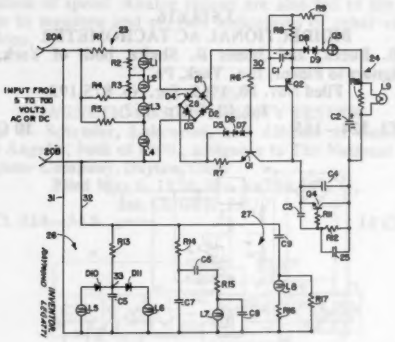


An improvement to a system for measuring (a) the voltage level of a waveform at a specific time with respect to a reference point in time, (e.g., clock or sync pulse) and (b) the time required with respect to a reference time for a waveform to reach a specific voltage level. In the first case, the voltage at a given sample time is measured, while in the second case, the time to a given voltage is measured. The system incorporates a go/no-go decision circuit which determines if the characteristics of a circuit under test satisfy certain reference criteria. The go/no-go circuit comprises a discriminator which examines a test signal for both amplitude and time. The discriminator compares the level of the input test signal with a reference signal at the time of strobe occurrence. The condition of the discriminator is monitored by a detector circuit which further passes this condition on to a voting logic which makes a go/no-go decision based on a plurality of samples.

3,614,610
PORTABLE VOLTAGE AND FREQUENCY TESTER
Raymond H. Legatti, Moultrie, Ga., assignor to Electromagnetic Industries, Inc., Sayville, L.I., N.Y.
Filed July 7, 1969, Ser. No. 839,338
Int. Cl. G01r *15/08, 19/14*
U.S. Cl. 324—115 **8 Claims**

A portable voltage and frequency tester includes a pair of probes for connection to a source of potential. A voltage

divider and associated neon lamps, lit in cascade, are connected across the probes and indicate AC voltages from 110 to 440 and DC voltages from 110 to 650. A second voltage indicator is connected across the probes and includes an incandescent lamp and an audible signal generator which are energized in alternation to indicate a minimum voltage of 25 volts or more across the probes.



3,614,611

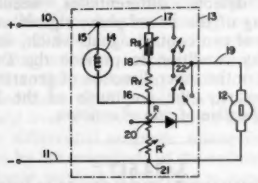
VOLTAGE AND WATTAGE INDICATOR FOR ARC LAMPS

Fred Benjamin, 3251 Santa Maria Ave., Fullerton, Calif.

Continuation of application Ser. No. 780,128, Nov. 29, 1968, now abandoned. This application June 25, 1970, Ser. No. 56,063

Int. Cl. G01r *1/00, 21/00*

U.S. Cl. 324—142 **2 Claims**



An inexpensive wattage indicator is provided in the form of a meter designed to indicate the sum of the voltage drops across a shunt in series with a source and load and a portion of a resistance means connected across the load. The resistance value of the shunt and resistance means and the meter scale are so adjusted that the indication of the sum corresponds substantially to the product of current and voltage supplied to the load thereby providing an indication of the wattage.

3,614,612

COIL ASSEMBLY FOR MOVING-COIL INSTRUMENTS

Willy Kisselmann, Grunwald, Ludwig-Thoma; Fritz Rumpelein, Munich; Franz Landbrecht, Unterhaching, and Paul Knopf, Duisberg, all of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany

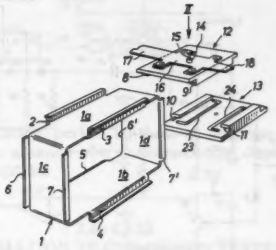
Filed Mar. 26, 1969, Ser. No. 810,585

Claims priority, application Germany, Mar. 30, 1968, P 17 66 082.1

Int. Cl. G01r *1/00, 1/14*

U.S. Cl. 324—154 **18 Claims**

A coil assembly for moving-coil instruments wherein the coil is wound around a hollow rectangular frame connected with two elastic plastic carriers each of which supports a staff. The carriers are adjacent to two outer sides of the frame which are located opposite each other, and each carrier is normally separated from the adjoining portion of the coil by a gap so that it can be flexed inwardly in response to axial pressure against the respective staff. At least one of the carriers supports a holder for the pointer, balance weight and/or other parts of the coil assembly.



3,614,613

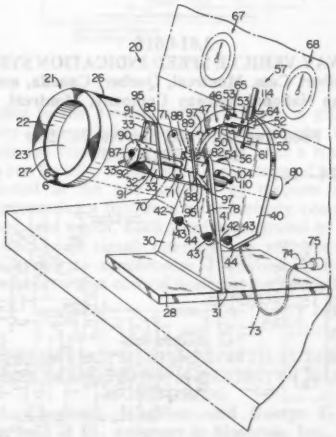
APPARATUS FOR AND METHOD OF TESTING AND BLOCKING STRIP CONDUCTOR COILS

Hans A. Brunner, Chester, Va., assignor to Reynolds Metals Company, Richmond, Va.

Filed Aug. 5, 1968, Ser. No. 750,083

Int. Cl. G01r *31/02, 31/06*

U.S. Cl. 324—158 R **10 Claims**



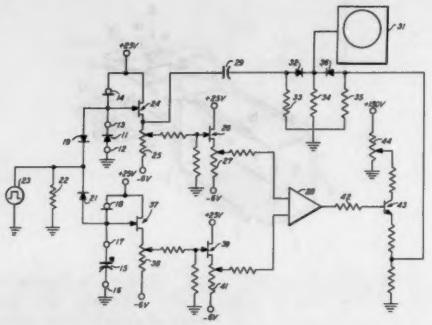
This disclosure relates to a simple apparatus for and method of testing and blocking electrical coils made from an elongated strip of electrically conductive material which utilizes a radially expandable mandrel to hold a coil in position so that one or more leads thereof may be easily connected in an associated electrical circuit using rapidly operating electrical connectors comprising the apparatus, and with a given coil thus held it is rapidly tested and if found acceptable the coil is immediately blocked prior to removal thereof from such mandrel.

3,614,614

METHOD AND CIRCUIT FOR MEASURING EFFECTIVE CAPACITANCE OF A SEMICONDUCTIVE DEVICE

Ronald L. Starliper, Burlington, N.C., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed Aug. 6, 1969, Ser. No. 847,962
Int. Cl. G01r 31/22, 27/26
U.S. Cl. 324—158 D 12 Claims



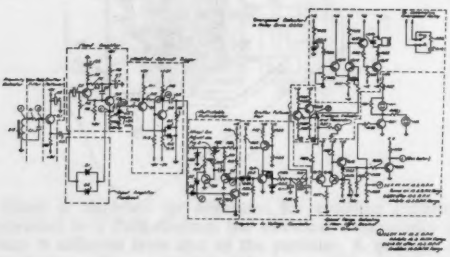
The effective or DC junction capacitance of a semiconductive device, which varies as a function of voltage, is measured by simultaneously applying a charging voltage to the device to be measured and to a calibrated, standard value of capacitance. The voltage across the device, as successive pulses of charging voltage are applied thereto, is displayed on an oscilloscope. A voltage spike is also applied to the oscilloscope input from a differential voltage comparator when the voltage across the device is equal to the voltage across the standard capacitor. This voltage superimposes a spike on the oscilloscope trace of the device voltage. The voltage at which the spike occurs on the oscilloscope display is the voltage at which the effective device capacitance is equal to the standard capacitance. By varying the standard value of capacitance, the effective diode capacitance is read directly from the standard capacitance at various voltages as indicated on the oscilloscope display.

3,614,615

RAILWAY VEHICLE SPEED INDICATION SYSTEM

George Robert Cass, Montreal, Quebec, Canada, assignor to Canadian National Railway Company, Montreal, Quebec, Canada

Filed Aug. 23, 1968, Ser. No. 767,590
Int. Cl. G01p 3/56
U.S. Cl. 324—161 9 Claims



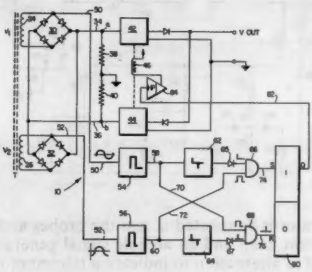
The rotation of a railway vehicle wheel is used to supply a periodically varying signal. The periodically varying signal is used to (a) generate a series of pulses of constant amplitude and duration and proportional in frequency to the periodically varying signal which constant amplitude duration pulses are subjected to an integration-type operation to produce an analogue indication of the railway vehicle speed; and (b) generate pulses of frequency proportional to that of the periodically varying signal, which may be counted and displayed over a sampling period to provide a digital indication of the railway vehicle speed. With the digital indication a scale switching arrangement is provided so that the indicated speed units are larger at low than at high speeds. Provision in the system is made so that switching from low-speed to high-speed scale takes place at a higher speed than from high-speed to low-speed scale to reduce the frequency of scale switching.

3,614,616

BIDIRECTIONAL AC TACHOMETER

Jiri B. Bucek, and James R. Shultz, both of York, Pa., assignors to Fincor, Inc., York, Pa.

Filed Nov. 10, 1969, Ser. No. 875,193
Int. Cl. G01p 3/52
U.S. Cl. 324—165 10 Claims



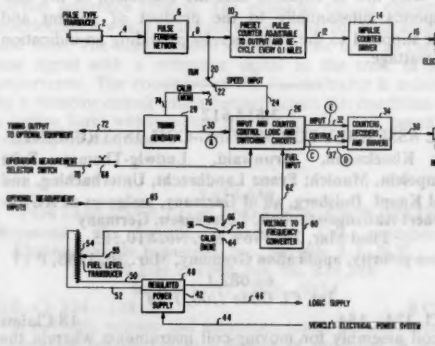
An alternating current tachometer and circuit in which an AC tachometer generator has two 90° out-of-phase windings independently connected through rectifiers, with outputs connected in parallel to provide a DC output potential. Using a large number of poles in the AC generator results in DC with a low ripple component. A reversing relay in the bridge output circuit applies the DC to an output signal terminal at a positive or negative level (relative to a common lead) depending upon and hence indicative of the direction of rotation of the tachometer generator. An electric circuit controls the relay condition in response to correlation of the two out-of-phase alternating signals, the signals being independently detected at their zero crossover point. The control circuit detects, differentiates, accomplishes a comparison gating of the out-of-phase signals and provides one or the other of two control signals which, via a register, controls the relay condition to provide the DC potential representing one or the other direction of generator rotation. Regardless of polarity, the amplitude of the DC voltage output will be indicative of rate of rotation.

3,614,617

DIGITAL INSTRUMENTATION SYSTEM FOR MOTOR VEHICLES

Bernard S. Blake, Jr., 515 Glencoe Road S.E., Huntsville, Ala.

Filed Nov. 21, 1969, Ser. No. 878,609
Int. Cl. G01p 3/54
U.S. Cl. 324—166 2 Claims



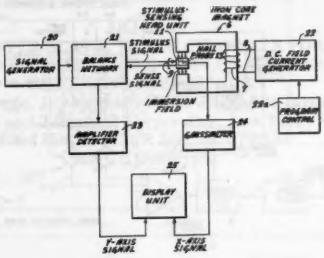
A transducer magnetically coupled to a vehicle's drive system produces pulses corresponding to the vehicle's wheel

rotation. The pulses are fed to a preset counter which provides one output pulse per each predetermined number of input pulses, and the output pulses from the preset counter are counted to give an indication of mileage. Pulses from the transducer are also fed to a logic system to provide an indication of speed. Analog signals are also fed to the logic system to measure and provide indications of other vehicle functions.

3,614,618
MAGNETIC SUSCEPTIBILITY TESTER

George F. Schrader, Lakewood, and Albinas A. Vaiciunas, Los Angeles, both of Calif., assignors to The National Cash Register Company, Dayton, Ohio

Filed May 6, 1970, Ser. No. 35,178
Int. Cl. G01r *33/12*
U.S. Cl. 324—34 S **14 Claims**



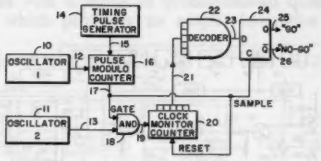
A testing apparatus for nondestructive testing of the magnetic characteristics of a portion of magnetic thin-film on a magnetic recording disc is disclosed. The recording disc is inserted into a slotted area of the yoke of an electromagnet so that a DC magnetic immersion field is provided parallel to the surface of the disc. This DC field is generated in an increasing magnitude ramp at the same time that a high-frequency stimulus field is generated adjacently parallel to the magnetic thin-film. A sense winding interwoven with the stimulus field coil will pick up signals representative of how well the thin magnetic film couples the stimulus field coil and the sense coil at the various magnitudes of DC field. A plot of the rectified sense signal amplitude against the magnitude of the DC field over a short time period on a readout device indicates the differential magnetic susceptibility of the thin magnetic film by the magnitude of the ordinate of the plotted curve. A balance network is provided to cancel any coupling between the stimulus coil and sensing coil when a negative immersion field is made to saturate the thin film. The magnetic characteristics for assessing merit which may be determined are: the coercive force of the film, and the magnetic susceptibility which is a measure of the relative squareness of the hysteresis loop and therefore a measure of the maximum magnetic switching rate.

3,614,619
DIGITAL CLOCK ACCURACY MONITOR

Dean P. Huntsinger, Marion, and Michael W. Lundgreen, Cedar Rapids, both of Iowa, assignors to Collins Radio Company, Cedar Rapids, Iowa

Filed Jan. 13, 1970, Ser. No. 2,601
Int. Cl. G01r *23/02*
U.S. Cl. 324—78 Q **7 Claims**

First and second clock sources are monitored on a digital basis by developing a gating pulse the width of which is proportional to the frequency of one of said oscillators and gating the second oscillator frequency to a binary counter for the duration of the gating pulse whereupon a predetermined count is effected in said counter corresponding to the nominal frequency of each of the oscillator sources. A decoder monitors the count in the binary counter and provides an output when the count corresponds to the nominal value. Deviation of either of the oscillators from its nominal frequency by over a predetermined percentage variation applies more or less pulses at the second oscillator rate to the counter. The total count entered into the counter

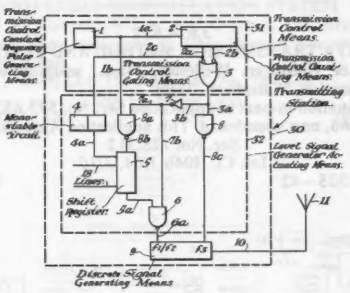


during a calculation period is then at variance with the decoder and the absence of a decoder output depicts an out of frequency situation.

3,614,620
INFORMATION TRANSMISSION SYSTEM

Vivian David, Valley Way, N.J., assignor to Westinghouse Brake and Signal Company Limited, London, England

Filed Oct. 23, 1969, Ser. No. 868,683
Claims priority, application Great Britain, Oct. 23, 1968, 50,222/68
Int. Cl. H04b *1/00*
U.S. Cl. 325—30 **3 Claims**



According to the present invention there is provided an information transmission system in which items of information are transmitted sequentially over a transmission link from one location to another. These items of information are requested at the one location by discrete frequency signals representing a first or a second binary condition and are grouped into words. Each word is separated by a further discrete frequency signal operable on reception at the another location to synchronize a control device at the another location with a control device at the one location.

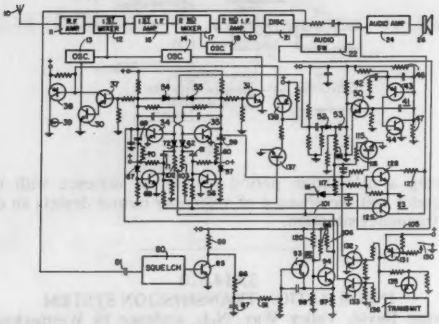
3,614,621
MULTIFREQUENCY RECEIVER WITH AUTOMATIC CHANNEL SELECTION AND PRIORITY CHANNEL MONITORING

Ronald H. Chapman, Wheaton, and George G. Moore, Chicago, both of Ill., assignors to Motorola, Inc., Franklin Park, Ill.

Filed Aug. 8, 1969, Ser. No. 848,628
Int. Cl. H04b *1/36*
U.S. Cl. 325—334 **17 Claims**

A channel scanning and priority channel monitoring circuit for a multifrequency receiver utilizes a bistable multivibrator to control the local oscillator frequencies corresponding to the channels, with one output of the multivibrator corresponding to the priority channel. A low-frequency free-running oscillator and a pair of monostable delay circuits, having a relatively short time interval, produce pulses to change the state of the multivibrator. With no signals being detected on any of the channels, the multivibrator is controlled by the monostable delay circuits to provide a

relatively rapid sequential scanning of the channels. Detection of a carrier on a nonpriority channel, however, shifts control of the bistable multivibrator to the free-running oscillator to reset the bistable multivibrator to scan the



priority channel, whereupon control is returned to the monostable circuits. Provision is made for attenuating the audio output whenever a nonpriority channel is being received and for increasing the sensitivity of the squelch circuit whenever a nonpriority channel is being scanned.

3,614,622

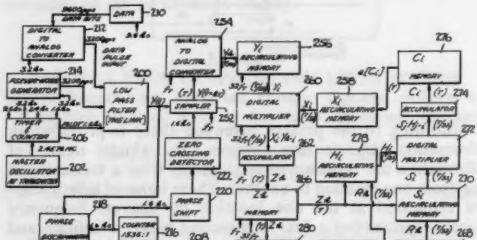
DATA TRANSMISSION METHOD AND SYSTEM

Jerry Lee Holsinger, Wellesley, Mass., assignor to Codex Corporation, Watertown, Mass.

Continuation-in-part of application Ser. No. 573,653, Aug. 19, 1966, now abandoned. This application Apr. 30, 1968, Ser. No. 725,312

Int. Cl. H04b *3/04, 3/10*

U.S. Cl. 325—42 **2 Claims**



Equalizers having variable coefficients which develop correction values from sums of weighted equalizer output errors that enable, among other things, rapid universal convergence both for initial setup and in the presence of data and inexpensive instrumentation. Disclosed are use of timed samples as the basis for the equalizer operation, digital filters as well as tapped delay lines to form the equalizer, weight forming continuously as well as infrequently, weight forming based upon the input to the equalizer, use of weights that have a sliding relationship in which a given error value is weighted by successive weights in forming successive correction values, and error forming based upon subtraction of signals representative of the output desired from the actual output of the equalizer.

Equalization in the presence of data is shown using the unequalized input to form the weights. In an example using pseudo-noise the weights are formed by cross-correlation of the input with the pseudo-noise. In an example using no pseudo-noise the data is treated as random and the unequalized input is employed to weight the equalizer output errors directly.

Various desired responses are shown helping to solve carrier jitter and other data handling problems.

3,614,623

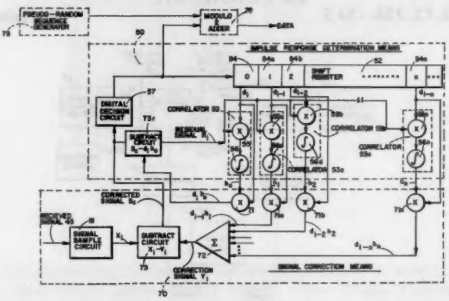
ADAPTIVE SYSTEM FOR CORRECTION OF DISTORTION OF SIGNALS IN TRANSMISSION OF DIGITAL DATA

Gerald K. McAuliffe, Mahopac, N.Y., assignor to North American Rockwell Corporation

Filed Apr. 21, 1969, Ser. No. 817,887

Int. Cl. H04b *1/10*

U.S. Cl. 325—42 **12 Claims**



An adaptive-type system which provides improved arrangements for correction of distortion of digital data sent over a transmission channel. The system includes a data shift register which stores received data bits and cross-correlates these with the signal being received to thereby obtain the impulse response of the transmission channel to provide compensation therefor. Cross-correlation networks produce a correction signal for compensation by digitally multiplying each of the *n* most recently received data bits by any residual distortion remaining in a sampling of the received signal after compensation and integrating the respective products. Residual distortion is detected by comparison of the sampling of the received signal after compensation and the signal for the most recent data bit to provide a residual signal. This residual signal is applied to the correlation circuits to produce a final correction signal which eliminates any distortion causing errors in transmission of the digital data. Another embodiment of the invention also compensates for cross-channel distortion arising in a quadrature modulation system.

3,614,624

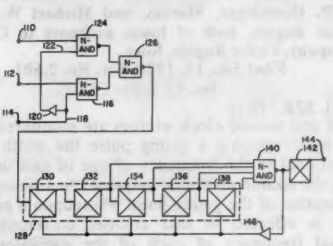
DEVICE FOR TRANSLATING BINARY DATA TO A JITTER-CONTROLLED ASYNCHRONOUS FREQUENCY MODULATED SIGNAL

Frank A. Scarpino, Dayton, Ohio, assignor to The National Cash Register Company, Dayton, Ohio

Filed Apr. 1, 1969, Ser. No. 811,894

Int. Cl. H04l *27/12*

U.S. Cl. 325—163 **13 Claims**



A circuit for translation of binary data signals to a jitter-controlled frequency modulated output signal comprises

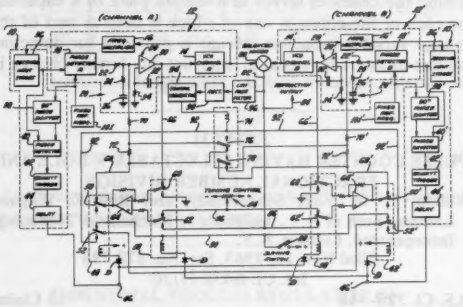
means producing a first clock signal divided by passing the same through a counter or scaler which provides an output each time a predetermined number of clock cycles has been received thereby. The successive outputs of the scaler shift a bistable element such as a flip-flop to produce an output square wave representing a first of two frequencies of the frequency modulated output signal. The second frequency of the output signal is derived from a second clock signal of different frequency divided through the same scaler, or, in the alternative, from the same clock signal divided through a second scaler of different predetermined cycle capacity. In the latter case, one scaler idles while the other scaler generates an output wave and additional clock signals are employed, as required, to advance the idling scaler to maintain phase continuity for the instant of a shift in data signals so that the new wave generated through the previously idling scaler will have at least approximate phase continuity with the old wave.

3,614,625

MASTER-SLAVE, TUNED CHANNELS FOR SIMULTANEOUS TRACKING OF PLURAL SIGNALS OF DIFFERENT FREQUENCIES

Albert T. Mayle, Jr., Newhall, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Oct. 30, 1967, Ser. No. 679,108
Int. Cl. H04b *1/06*
U.S. Cl. 325—307 **11 Claims**



Receiver apparatus for receiving and locking to a pair of harmonically related RF signals, including a pair of phase-lock loops for the respective RF channels and a primary acquisition circuit for each of the phase-lock loops. Switching means is responsive to primary acquisition in either channel to slave the unlocked loop in the other channel to the locked loop in a secondary acquisition so as to automatically adjust the control frequency of the slaving loop to approximately the correct frequency for primary acquisition in said other channel.

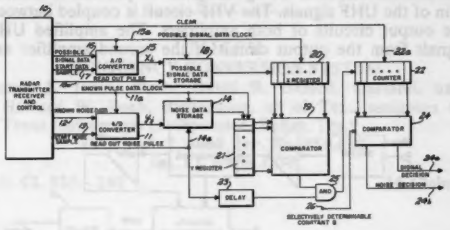
3,614,626

RADAR DETECTOR SYSTEM

George M. Dillard, San Diego, Calif.

Filed Jan. 25, 1966, Ser. No. 522,986
Int. Cl. H04b *1/10*
U.S. Cl. 325—323 **6 Claims**

A system is disclosed for improved detection of signals in the presence of noise and interference. It employs a distribution-free criteria to indicate either the presence or absence of signal. A source of known noise data is connected to means for converting the known noise data to digital form. A separate means for converting signal analog input data similarly converts this data to digital form. An appropriate means is provided for successively comparing the digital quantity of each increment of determinable sequence of the input data with the digital quantity of each increment of a like sequence of the known noise data. This latter means is responsive to the quantitative difference detected for each incremental comparison for producing a signal which is commensurate with the determined difference. The difference signals thus produced for each compared sequence are summed and the sum of the difference signals are compared with a signal of predetermined quantitative significance which produces an output indicative of the



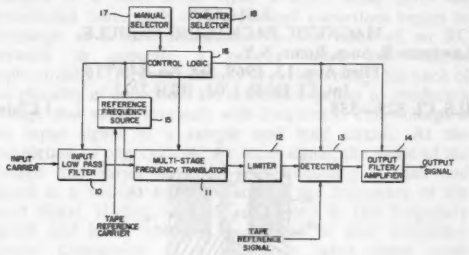
presence of signal in the analog input data when the summed difference signals exceed the signal of predetermined quantitative significance and produces an output indicative of the absence of signal in the analog input data when the signal of predetermined quantitative significance exceeds the summed difference signals.

3,614,627

UNIVERSAL DEMODULATION SYSTEM

Raymond A. Runyan, Wilton, and Owen J. Ott, Brookfield, both of Conn., assignors to Data-Control Systems, Inc., Danbury, Conn.

Filed Oct. 15, 1968, Ser. No. 767,628
Int. Cl. H04b *1/06*
U.S. Cl. 325—345 **25 Claims**



An FM demodulation system useful to demodulate any carrier signal of any deviation within prescribed ranges with unitary apparatus. A plurality of band pass filters is employed, each filter having a predetermined bandwidth, and selected filters are operatively arranged with a plurality of frequency translators such that an input signal can be heterodyned to the center frequency of the filter having the requisite bandwidth for the deviation of the particular input signal.

3,614,628

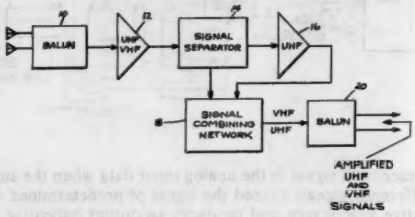
UHF-VHF ANTENNA PREAMPLIFIER

Robert S. Ringland, Burlington, Iowa, assignor to Antennacraft Company, Burlington, Iowa

Filed Dec. 5, 1968, Ser. No. 781,392
Int. Cl. H04b *1/18*
U.S. Cl. 325—365 **4 Claims**

This invention relates to a preamplifier which may be attached directly to an antenna adapted to receive both UHF and VHF television signals. Within the preamplifier there are two stages of amplification and a signal separation network adapted to separate the VHF signals from the UHF signals for individual treatment. The two amplifiers are arranged in successive stages, with the first stage being coupled directly

to the antenna terminals. This first amplifier is adapted to amplify both the UHF and VHF signals. A signal-separating network is coupled between the two amplifiers and contains two networks, each adapted to readily pass one of the UHF and VHF signals and drastically attenuate the other. The UHF network is connected between the output circuit of the first amplifier and the input circuit of the second amplifier, the second amplifier being designed to provide maximum gain of the UHF signals. The VHF circuit is coupled between the output circuits of both amplifiers. The amplified UHF signals from the output circuit of the second amplifier are



combined in a signal-combining circuit with the VHF signals from the first amplifier, and these in turn are coupled to an impedance-matching network designed to be connected directly to a twin lead transmission line which leads to the television receiver. By providing the signal-separating network in the output circuit of the first amplifier, the inherent noise therein will not be amplified initially. Therefore, there results the application of an amplified television signal to the transmission line having a higher signal-to-noise ratio than would have been obtained had the signal separation taken place in the input circuit of the first amplifier.

3,614,629

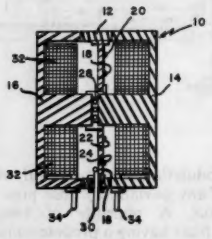
MAGNETIC PACKAGING MODULE

Lawrence B. Sues, Rome, N.Y.

Filed Aug. 13, 1969, Ser. No. 849,718

Int. Cl. H04b *1/08*; H03f *7/02*

U.S. Cl. 325—355 **1 Claim**



A radio frequency module employing a segmented magnetic structure for packaging a ferrimagnetic tuned circuit. The planar electronic circuitry is packaged in the center section of a three part magnetic structure. Connector pins positioned on the bottom of the module serve to conduct the output signals from the electronic circuitry and to control the magnetic field intensity by means of solenoids located in the outer sections of the module.

3,614,630

RADIO FREQUENCY STANDARD AND VOLTAGE CONTROLLED OSCILLATOR

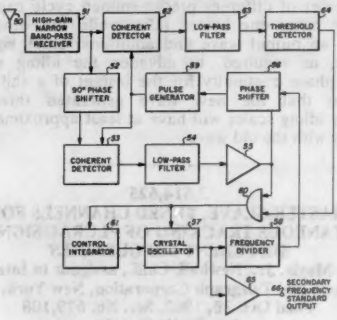
Louis H. Rorden, Menlo Park, Calif., assignor to Develco, Inc., Mountain View, Calif.

Filed Feb. 4, 1969, Ser. No. 796,539

Int. Cl. H04b *1/16*

U.S. Cl. 325—421 **11 Claims**

A radio signal controlled oscillator is provided as a local frequency standard by synchronizing the oscillator using a phase-lock servosystem comprising a long term integrating device as a voltage variable capacitor in the resonant circuit of the oscillator. The device consists of two columns of mercury separated by a substantial gap of electrolyte in a chamber made of dielectric material. Upon comparison of the oscillator signal with the radio signal, any error signal developed is applied across the electrolyte gap to the



mercury column to transfer mercury from one to the other by the process of electrolysis. Conductive material wrapped around the chamber serves as a second plate of a capacitor for each of the columns one of which is used as part of the voltage variable capacitor. Means is provided for detecting the loss of the radio signal to interrupt any further change in the variable capacitor until the radio signal is restored.

3,614,631

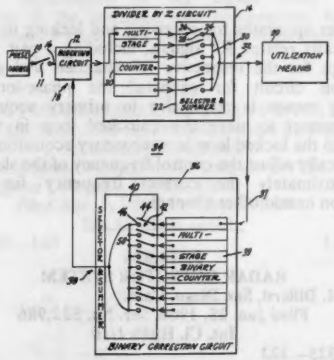
PULSE COUNTER HAVING SELECTABLE WHOLE AND FRACTIONAL NUMBER DIVISION

William E. Be Vier, Schenectady, and Rolf E. Wagner, Latham, both of N.Y., assignors to Mechanical Technology Incorporated, Latham, N.Y.

Filed Nov. 21, 1969, Ser. No. 878,793

Int. Cl. H03k *21/30*

U.S. Cl. 328—48 **13 Claims**



A system for correcting errors in pulse data signals generated by a repetitive source wherein the data signals are fed to a blocking circuit where they pass on to the output means of the system as long as a blocking signal is not present at the blocking circuit. The pulses which pass through the blocking circuit are divided into a selected discrete number of pulses included in the calibration factor. For each discrete number of pulses of the pulse source, the divider delivers one pulse to the system output means and

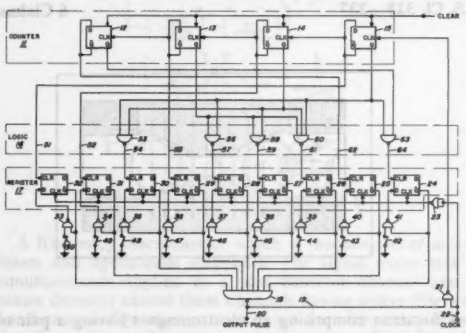
also one pulse to a feedback path which includes a binary correction circuit which is precoded to deliver a blocking signal to the blocking circuit when certain stages of the binary correction circuit are at the "1" level. The states which are operative to cause such a blocking signal to be sent to the blocking circuit are in direct relation to the arrangement of bits of the binary equivalent of the fractional part of the calibration factor so that there appears a precisely calibrated output from the system.

3,614,632

DIGITAL PULSE WIDTH GENERATOR

Lawrence M. Leibowitz, Fairfax, Va., and Richard K. Baldauf, Greenbelt, Md.

Filed Oct. 14, 1970, Ser. No. 80,652
Int. Cl. H03k *5/04*
U.S. Cl. 328—58 **4 Claims**



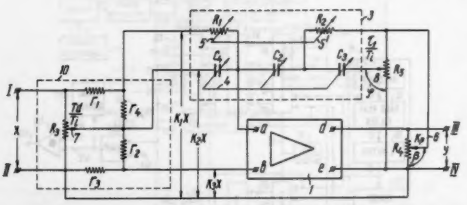
Logic circuitry for generating a pulse of width *n* units of time where *n* is any positive integer.

3,614,633

INDUSTRIAL PROCESS REGULATOR OF PROPORTIONAL PLUS INTEGRAL PLUS DIFFERENTIAL ACTION

Aly Umyarovich Yalyshev; David Veniaminovich Svecharnik; Vladimir Alexandrovich Pavlenko; Vyacheslav Alexeevich Tsarkov; Bonch-Bruevick Andrei Mikhailovich, and Boris Alexandrovich Levinson, all of Moscow, U.S.S.R., assignors to Gosudarstvenny Nauchno-issledovatelsky institut teploenergeticheskogo priborostroenia, Moscow, U.S.S.R.

Filed July 2, 1968, Ser. No. 741,978
Int. Cl. G06g *7/18*
U.S. Cl. 328—127 **2 Claims**



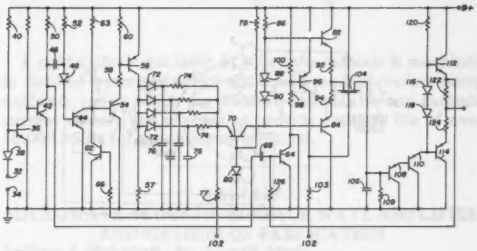
A regulator for industrial process control, including an amplifier and a negative feedback circuit. The regulator is of a proportional, plus integral, plus differential action type which includes RC components in the feedback group. The feedback group includes a plurality of resistors and capacitors having ganged slider arms and adjustment controls for maintaining a high accuracy over a wide range of parameters for the regulator. An input scaling device is provided including a voltage divider network and a potentiometer with the potentiometer connected through the feedback loop or circuit to an input of the amplifier. One input and an output of the amplifier are connected together to serve as a common bus point.

3,614,634

FREQUENCY CONVERSION SYSTEM

James J. Jones, Plano; David B. Oxford, Garland, and Howard W. Zuch, Richardson, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Sept. 2, 1969, Ser. No. 854,688
Int. Cl. H03b *3/04*
U.S. Cl. 328—140 **16 Claims**



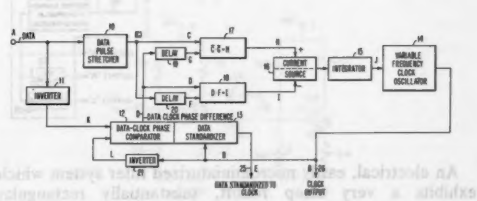
In many dynamic control systems, there is a need to rapidly and accurately convert the frequency of an input signal into a voltage proportional thereto. At a preselected time in a cycle of an input signal, a plurality of capacitors are charged to a reset level. After a fixed delay from the preselected time, each of the charged capacitors begins to discharge at a rate determined by the value of an RC network to generate a voltage signal that decays exponentially. The exponentially decaying voltage for each of the plurality of capacitors are summed together to produce a voltage that varies inversely with frequency. This voltage is the input signal to a sample and hold circuit. At the completion of one cycle of the input signal, the value of the voltage that varies inversely with frequency is read and stored as a voltage representative of the frequency of the input signal. Higher voltages correspond to fast frequency signals and lower voltages correspond to slow frequency signals. Conversion of a frequency takes place upon completion of a sampled cycle.

3,614,635

VARIABLE FREQUENCY CONTROL SYSTEM AND DATA STANDARDIZER

Anthony N. LaPine, San Jose, and Julian E. Vaughn, Campbell, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 31, 1969, Ser. No. 889,442
Int. Cl. H03b *3/04*
U.S. Cl. 328—155 **5 Claims**



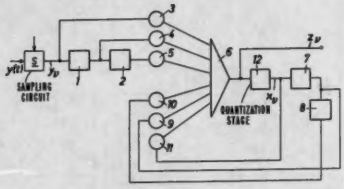
A variable frequency oscillator feedback control system performs a frequency control function and a data relocation

function. The oscillator is made to follow the frequency of random input data and individual incoming data pulses are relocated in time to correspond with the time slots defined by the oscillator output pulses. The feedback loop contains a novel DC logic phase comparator and data standardizer. The phase comparator controls the frequency of the oscillator while the data standardizer relocates the data pulses to the time slots of the oscillator pulses.

3,614,636
DISTORTION CORRECTION CIRCUIT FOR LINEARLY DISTORTED PULSE SEQUENCES

Broder Wendland, Pflugerstr. 1, 1 Berlin 44, Germany

Filed Sept. 26, 1969, Ser. No. 861,297
Claims priority, application Germany, Sept. 26, 1968, P 17 91 173.8
Int. Cl. H03b 1/00
U.S. Cl. 328—162 7 Claims

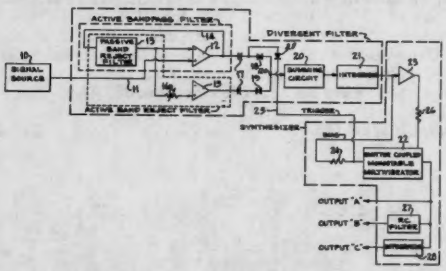


A circuit for correcting linear distortions in a received signal pulse train by converting the pulse train into a signal sequence by periodically sampling the received train and storing each sample value until the next sampling, quantizing the sequence in discrete amplitude levels identical with those of the initial pulse train, sequentially delaying the quantized sequence, multiplying each delayed sequence by a correction value, adding all multiplied sequences to the initial sequence at the quantizing input, and modifying the correction values in a direction to establish equality between the sequence values before and after quantizing.

3,614,637
DIVERGENT FILTER SYSTEM

Jacob H. Kubanoff, Philadelphia, Pa., assignor to The United States of America as represented by the Secretary of the Army

Filed Oct. 31, 1969, Ser. No. 872,970
Int. Cl. H03k 5/12
U.S. Cl. 328—167 13 Claims

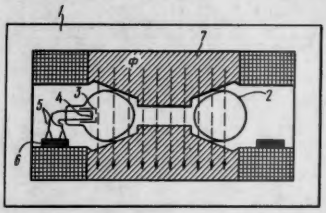


An electrical, easily microminiaturized filter system which exhibits a very steep rolloff, substantially rectangular response by obtaining the divergence or algebraic summation between the positively half-wave rectified response of a band-pass filter and the negatively half-wave rectified response of a band reject filter, both band filters having the same center frequency and bandwidth. Also provided is a synthesizer, including an emitter coupled monostable multivibrator, which is input bias controlled and output modulated to further enhance filter system response rectangularity through the controlled production of low amplitude narrow pulses in the region of rolloff and high amplitude broad pulses at the center of the band.

3,614,638
BETATRON

Lev Martemianovich Ananiev, ulitsa Lenina, 44, kv. 10; Yakov Semenovich Pekker, ulitsa Sovetskaya, 73, kv. 23; Vladimir Lukianovich Chakhlov, pereulok Zavodskoi, 8/1, kv. 8; Yakov Afanasievich Sharachin, poselok Sputnik, 15, kv. 22; Mikhail Mikhailovich Shtein, ulitsa Usova, 17, Kv. 8, and Jury Pavlovich Yarushkin, ulitsa L. Tolstogo, 65, kv. 8, all of Tomsk, U.S.S.R.

Filed May 7, 1969, Ser. No. 822,405
Int. Cl. H05h 11/00
U.S. Cl. 328—237 6 Claims

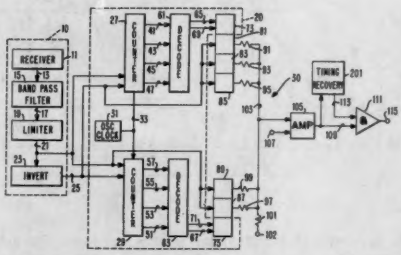


A betatron comprising an electromagnet having a pair of opposing poles spaced adjacent one another and acting to transfer a magnetic flux in a zone therebetween, is provided with an acceleration vacuum vessel interposed between the poles. An injector is mounted internally of the vessel and the injector includes an electron emissive filament. A winding coil is connected to one of the poles and surrounds the flux zone. The filament is electrically coupled with the winding for being heated by electrical energy induced in the winding in response to the magnetic flux.

3,614,639
FSK DIGITAL DEMODULATOR WITH MAJORITY DECISION FILTERING

Harris J. Belman, Rockville, Md., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed July 30, 1969, Ser. No. 846,112
Int. Cl. H04l 27/14
U.S. Cl. 329—104 10 Claims



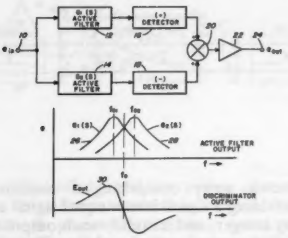
A digital FSK demodulator including frequency detecting circuits, temporary storage, and a majority detector. A plurality of the most recent data bits from the frequency

detecting circuits are stored and an output is generated by the majority detector which is a mark if the majority of stored bits are marks, and a space if the majority of stored bits are spaces.

3,614,640
FREQUENCY DISCRIMINATOR USING NO INDUCTIVE COMPONENTS

Frederick H. Wolf, Ellicott City, Md., assignor to The United States of America as represented by the Secretary of the Navy

Filed Jan. 27, 1970, Ser. No. 6,096
Int. Cl. H03d *3/06, 3/28*
U.S. Cl. 329—110 **4 Claims**

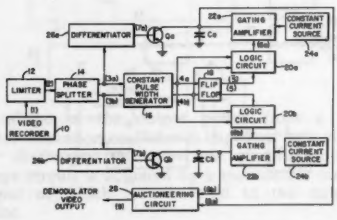


A frequency discriminator which is mechanized of active filters and operational amplifiers. The signal under test is simultaneously applied to a plus detector channel and a minus detector cannel these channels having active filters of band-pass configuration, one with a center frequency below the discriminator frequency and one above. The channels also have operational amplifier type detectors and the outputs of the two channels are combined, post detection filtering being accomplished by a summing amplifier by virtue of a RC feedback applied around this amplifier.

3,614,641
FREQUENCY DEMODULATOR

Francis T. Thompson, Murrysville, and Leonard C. Vercellotti, Verona, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 6, 1969, Ser. No. 863,829
Int. Cl. H03d *3/04*
U.S. Cl. 329—110 **13 Claims**

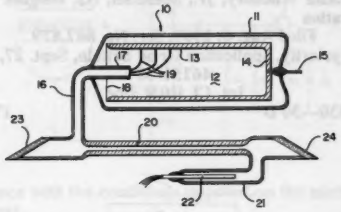


A frequency demodulator and method for demodulating frequency modulated (FM) signals, which may have been previously recorded on a recording medium, modulated in accordance with a video waveform, for example, wherein potentials are stored, for example, by capacitors, in response to selected half-periods of the recorded FM signals, and selecting, by auctioneering for example, one of the stored potentials which is indicative of the intelligence in the FM signals under consideration.

3,614,642
GAS LASER

Urs Hochuli, Hyattsville, and Paul R. Haldemann, College Park, both of Md., assignors to The University of Maryland, College Park, Md.

Filed Sept. 14, 1966, Ser. No. 579,293
Int. Cl. H01s *3/22*
U.S. Cl. 330—4.3 **10 Claims**

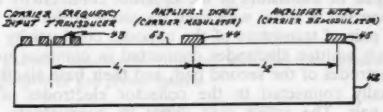


A cold cathode gas laser, in which the cathode is machined in distilled water and is not chemically treated, before being oxidized, and in which gas pressure and volume and cathode current density are selected to provide cathode life of over 10,000 hours for a cathode so prepared.

3,614,643
MICROWAVE ACOUSTIC SURFACE WAVE AMPLIFIER AND METHOD OF FABRICATION

Andrew J. Slobodnik, Jr., Lowell, Mass.

Filed Apr. 1, 1970, Ser. No. 24,691
Int. Cl. H03f *13/00*
U.S. Cl. 330—5.5 **4 Claims**

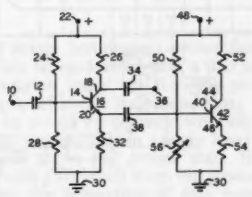


Nonlinear acoustic properties of crystalline media are utilized to achieve amplification in an acoustic surface wave device. Power density curves of acoustic surface waves traveling along a piezoelectric substrate member have been found to exhibit negative slopes. Amplification is accomplished by modulating the acoustic surface wave at a point on the substrate member corresponding to the first zero slope and demodulating it at the second zero slope.

3,614,644
AMPLIFIER APPARATUS WITH DISTORTION COMPENSATION

Daniel Liberman, Seneca Falls, N.Y., assignor to Sylvania Electric Products Inc.

Filed Dec. 15, 1969, Ser. No. 884,988
Int. Cl. H03f *1/08*
U.S. Cl. 330—28 **8 Claims**



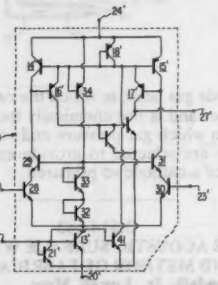
A transistor amplifier is shown wherein a second transistor is connected to generate distortion components substantially

the same as those generated by non-linearities of the base-emitter junction of a transistor connected as the amplifier. The distortion components so generated are coupled to the emitter of the amplifier transistor to reduce the distortion due to the base-emitter nonlinearity.

3,614,645
DIFFERENTIAL AMPLIFIER

Carl Franklin Wheatley, Jr., Somerset, NJ, assignor to RCA Corporation

Filed Aug. 6, 1969, Ser. No. 847,879
Claims priority, application Great Britain, Sept. 27, 1968, 46151/68
Int. Cl. H03f 3/68
U.S. Cl. 330—30 D **17 Claims**

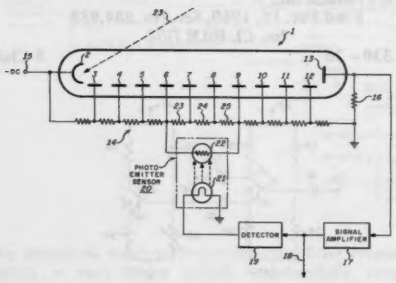


A differential amplifier comprising a pair of transistors of one conductivity type has an active load circuit comprising a second pair of transistors of the opposite conductivity type, one connected in series with each transistor of the first pair. A third pair of transistors of the opposite conductivity type have their emitter electrodes connected in common to the base electrodes of the second pair, and their base electrodes individually connected to the collector electrodes of the second pair. The active load varies its conductivity as a function of common mode currents while developing a substantially constant voltage drop. Differential signal currents develop significant voltage drops which are simultaneously coupled by the third pair of transistors to an output load circuit.

3,614,646
PHOTOMULTIPLIER TUBE AGC USING PHOTOEMITTER-SENSOR FOR DYNODE BIASING

Earl T. Hansen, Salt Lake City, Utah, assignor to Sperry Rand Corporation

Filed Oct. 18, 1967, Ser. No. 676,275
Int. Cl. H03f 17/00
U.S. Cl. 330—59 **5 Claims**

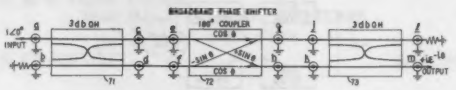


A photomultiplier tube automatic gain control circuit wherein the biasing potentials between a plurality of adjacent dynodes are varied inversely as the amplitude of the photomultiplier output signal. The output signal is detected and applied to a photoemitter-sensor connected in shunt with the biasing network for the aforesaid dynodes.

3,614,647
GENERALIZED IMPEDANCE-MATCHED MULTIBRANCH ARRAY

Harold Seidel, Warren, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Nov. 4, 1969, Ser. No. 874,001
Int. Cl. H03f 3/68
U.S. Cl. 330—124 **6 Claims**

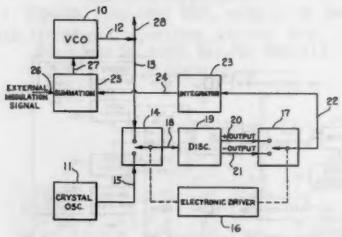


A multibranch array comprising a multibranch input network for dividing a signal into n equal signal components, where n is any integer, and a multibranch output network for recombining said components in phase. The networks are interconnected by means of n branch circuits which include first phase shifters for producing phase differences among the branch signals equal to different multiples of $180\ m/n°$, where m is an integer less than n. Second phase shifters produce complementary phase shifts to restore the signals to a common phase for recombination in the output network. Amplifiers or other circuit elements are located in each of the branch circuits between pairs of phase shifters.

3,614,648
AUTOMATIC FREQUENCY CONTROL LOOP INCLUDING SYNCHRONOUS SWITCHING CIRCUITS

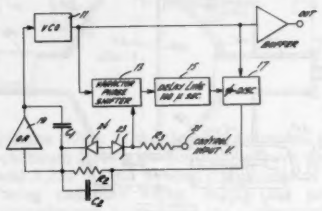
Frank Byrne, Cocoa Beach, Fla., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Sept. 10, 1970, Ser. No. 71,047
Int. Cl. H03b 3/04
U.S. Cl. 331—14 **5 Claims**



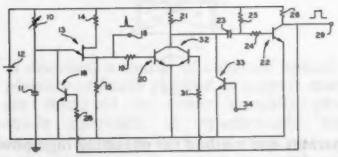
A circuit for producing precise and exact frequency reference that includes a voltage controlled oscillator, a crystal oscillator, a discriminator, an integrator, and a pair of electronic switches. One electronic switch alternately couples the frequencies from the voltage controlled oscillator and the crystal oscillator to the discriminator which produces alternate DC signals on its output. The second electronic switch produces a composite signal which is fed to the integrator for producing a corrective DC signal that is fed back to the voltage controlled oscillator to cause such to come in alignment with the crystal oscillator.

3,614,649
FREQUENCY STABILIZATION OF CONTINUOUSLY TUNABLE OSCILLATORS
John S. Gerig, McLean, Va., assignor to Reaction Instruments, Incorporated, Vienna, Va.
Filed Dec. 24, 1969, Ser. No. 887,957
Int. Cl. H03b *3/04*
U.S. Cl. 331—17 **7 Claims**



A voltage controlled oscillator with a controllable phase shifter and a delay line connected in series with the output of the oscillator. A phase discriminator measures the phase difference between the output of the oscillator and the output of the delay line and feeds back a difference signal which, suitably conditioned, dynamically stabilizes the frequency of the oscillator.

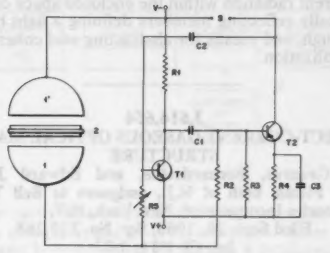
3,614,650
UNIJUNCTION TRANSISTOR RELAXATION OSCILLATOR WITH RAPID CAPACITOR DISCHARGE CIRCUIT
Earl L. DeShazo, Jr., Bartlesville, Okla., assignor to Phillips Petroleum Company
Filed May 18, 1970, Ser. No. 38,199
Int. Cl. H03k *3/26*
U.S. Cl. 331—52 **6 Claims**



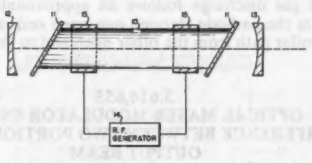
The shape of the output pulses from a unijunction transistor relaxation oscillator is improved by a circuit which rapidly discharges the capacitor of the oscillator. The discharge circuit is actuated by a monostable multivibrator, the input of which is connected to the output of the oscillator.

3,614,651
EXTERNAL CONTROL OF VARIABLE FREQUENCY OSCILLATOR
Claude-Marie Pasquier, 37, Avenue de Saxe, Paris, and Francoise Mannel-Sanson, 5, rue de l'Adde Dubos, 60 Beauvais, both of France
Filed June 27, 1969, Ser. No. 837,042
Int. Cl. H03b *5/30*
U.S. Cl. 331—65 **2 Claims**

An electronic control device comprising a pair of electrodes connected in an oscillator circuit. The electrodes are designed to be held between the hands of a subject and the oscillator output frequency is continuously variable in accordance with the conditions imposed on the electrodes by the subject.

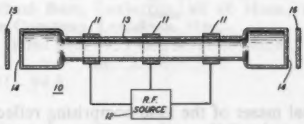


3,614,652
OPTICAL WINDOWS FOR LASERS
Van O. Nicolai, Reston, Va.
Filed Apr. 24, 1970, Ser. No. 31,473
Int. Cl. H01s *3/02*; **G02b** *1/00*
U.S. Cl. 331—94.5 **1 Claim**



A gallium antimonide optical window component for use in high-power gas phase lasers.

3,614,653
OPTICAL MASER
Ali Javan, Boston, Mass.; William R. Bennett, Jr., New Haven, Conn., and Donald R. Herriott, Morristown, N.J., assignors to Bell Telephone Laboratories, Incorporated, New York, N.Y.
Continuation-in-part of application Ser. No. 79,062, Dec. 28, 1960, now Patent No. 3,149,290, dated Sept. 15, 1964. This application May 2, 1963, Ser. No. 277,651
Int. Cl. H01s *3/00*
U.S. Cl. 331—94.5 **11 Claims**



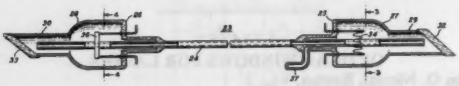
An optical maser comprising: means for producing free electrons within an enclosed space, a first and a second gas within the enclosed space, the first gas possessing a metastable energy level above its ground state to which atoms thereof may be raised by collision with said free electrons, the second gas possessing an energy level system with at least two levels above the ground state, the separation of the higher of said two levels from the ground state substantially matching the separation of said metastable level of the first gas from its ground state, so that atoms of the first gas which are in the metastable state collide with ground state atoms of the second gas and excite said ground state atoms to said higher level, thereby creating a population

inversion between a pair of energy levels of said second gas so that emission of coherent optical radiation may be stimulated at a frequency corresponding to the energy separation therebetween, means for forming resonant modes of said coherent radiation within the enclosed space comprising two optically reflecting members defining a light beam path therethrough, and means for abstracting said coherent radiation for utilization.

3,614,654
DIRECT-CURRENT GASEOUS OPTICAL MASER STRUCTURE

Warren Gronros, Bernardsville, and Edward J. Walsh, Morris Plains, both of N.J., assignors to Bell Telephone Laboratories Incorporated, New York, N.Y.

Filed Sept. 20, 1963, Ser. No. 310,268
Int. Cl. H01s 3/02
U.S. Cl. 331—94.5 **12 Claims**

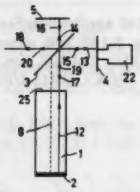


A direct-current gaseous optical maser comprises an elongated hollow cylinder that is open on both ends for defining a usable gas discharge path portion. A cathode and an anode are set back from the two ends within enclosures so that the gas discharge follows an approximately U-shaped path from the cathode through one open end of the cylinder and a similar path from the other open end to the anode.

3,614,655
OPTICAL MASER MODULATOR USING INTERFERENCE BETWEEN TWO PORTIONS OF THE OUTPUT BEAM

Bouwe Bolger, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 31, 1964, Ser. No. 341,633
Claims priority, application Netherlands, Feb. 22, 1963, 289372
Int. Cl. H01s 3/10
U.S. Cl. 331—94.5 **20 Claims**

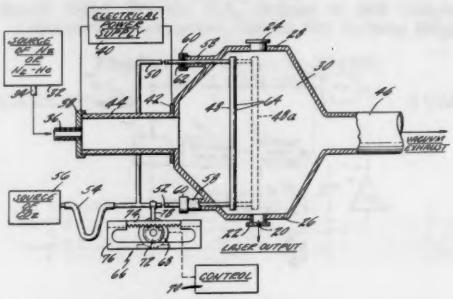


An optical maser of the kind comprising reflecting means at opposite ends of the active medium. A semitransparent mirror is included in the optical system so that the beam is divided into a reflected portion and a transmitted portion. Additional reflecting means are provided for returning the divided beam to the semitransparent mirror. Means are provided for controlling the length of the optical path between the semitransparent mirror and the reflecting means in order to control the phase difference between the reflected radiations. In this way, it is possible to modify, so to speak, the load on the maser and thus control the intensity of the emerging beam. The optical path length can be adjusted by mounting the reflecting means on an electrically controllable piezoelectric or magnetostrictive body. As an alternative, an electrooptic body can be included in the optical path.

3,614,656
GAS LASER

Edward A. Pinsley, Glastonbury, and Clyde O. Brown, Newington, both of Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Feb. 23, 1968, Ser. No. 710,696
Int. Cl. H01s 3/02
U.S. Cl. 331—94.5 **16 Claims**

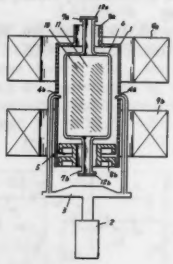


Carbon dioxide is injected into a stream of excited nitrogen by means of one or more manifolds or rods located directly within the laser chamber, disposed adjacent to and movable relative to the laser cavity.

3,614,657
CYLINDRICAL PLASMA LASER

Shuzo Hattori, Nagoyashi, Japan, assignor to Nihon Denshi Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 16, 1964, Ser. No. 418,764
Claims priority, application Japan, Dec. 27, 1963, 38/70626
Int. Cl. H01s 3/09
U.S. Cl. 331—94.5 **8 Claims**



An apparatus and method for obtaining high-power output oscillations from a gas laser by subjecting the gas to a magnetic field parallel to the axis of a tube containing the gas and to electromagnetic oscillations in a direction perpendicular to the longitudinal axis of the tube to produce a cylindrical plasma. The intensity of the magnetic field (H) and the frequency of the electromagnetic oscillations (f) being expressed by the general formula:
$f = eH/2\pi mc$. wherein
e = the electric charge of the gas particles,
m the average mass of the particles, and
c = the velocity of light.

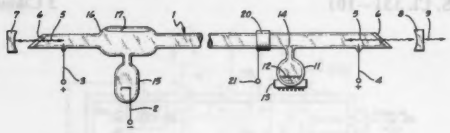
3,614,658
GAS LASER HAVING MEANS FOR MAINTAINING A UNIFORM GAS MIXTURE IN A DC DISCHARGE

John P. Goldsborough, San Jose, Calif., assignor to Spectra-Physics, Inc., Mountain View, Calif.

Filed Jan. 22, 1969, Ser. No. 792,952
Int. Cl. H01s 3/22, 3/05, 3/02
U.S. Cl. 331—94.5 **12 Claims**

A DC discharge gas laser in which the active medium is a mixture of gases having a low ionization potential

component. This component is supplied to the plasma tube at a position adjacent the anode and flows by DC cataphoresis in the direction of the cathode where it is removed from the system, thereby providing a substantial length of uniform ratio gas mixture which is particularly significant in small



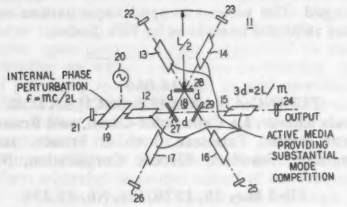
diameter plasma tubes. In the detailed examples, the laser is a helium-cadmium laser with continuous-wave operation at 4,416 A and 3,250 A, the flowing component of the active medium being cadmium vapor. Means are provided in modified embodiments to stabilize the concentration of the flowing component.

3,614,659

SYNCHRONOUS COUPLING OF LASER OSCILLATORS TO A COMMON RESONATOR

William W. Rigrod, Colts Neck, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Mar. 14, 1969, Ser. No. 807,242
Int. Cl. H01s 3/00
U.S. Cl. 331—94.5 **8 Claims**



There is disclosed a source of coherent optical energy in which a plurality of lasers pumped to support multiple axial modes are restricted to either mutually phase-locked multiple-mode operation or synchronized single-mode continuous-wave operation by mutual coupling to a common resonator that is adapted to support an additive buildup of intensity from the lasers in a manner providing mutual mode-frequency locking. The common resonator is either a ring or is an interferometric resonator of relatively great free spectral range compared to that of the laser resonators. Mode-frequency selection is facilitated by active media providing strong mode competition and/or by a common resonator having one or more loss ports that contribute to a strong filtering characteristic.

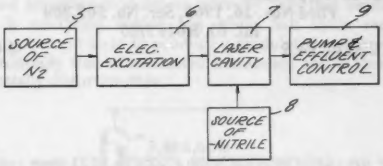
3,614,660

LASER EMPLOYING ALIPHATIC NITRILES AS A LASING GAS

Casper J. Ultee, Glastonbury, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed Mar. 27, 1969, Ser. No. 811,697
Int. Cl. H01s 3/14, 3/22
U.S. Cl. 331—94.5 **5 Claims**

A gas laser utilizes essentially vibrationally excited nitrogen or carbon monoxide as an energizing gas and, through resonant collisions with a lasing gas, transfers the energy to the lasing gas, preferentially to an upper laser energy level. The lasing gas is one of a group known as aliphatic nitriles which may either be introduced directly into



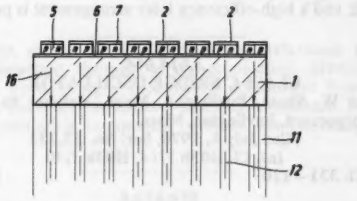
the laser cavity free of prior excitation or it may be mixed with the energizing gas prior to excitation. Laser energy at wavelengths between 5 and 15 microns is produced.

3,614,661

SEMICONDUCTOR LASER DIODE ARRANGEMENT FOR EXCITING LIGHT-WAVE CONDUCTORS

Manfred Borner, Ulm/Danube, and Gunter Goldbach, Neuenstadt, both of Germany, assignors to Telefunken Patentverwertungsgesellschaft m.b.H., Ulm/Danube, Germany

Filed July 23, 1968, Ser. No. 746,929
Claims priority, application Germany, July 27, 1967, P 16 14 846.2
Int. Cl. H01s 3/18
U.S. Cl. 331—94.5 **15 Claims**



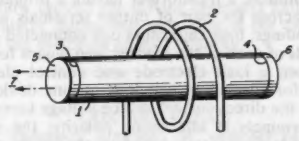
A laser diode semiconductor arrangement in which at least one semiconductor diode is provided on a surface of an insulated supporting body having a reflecting layer and in which such diode includes at least two different types of conductivity zones and a barrier separating such zones, perpendicularly disposed with respect to the reflecting layer surface of the supporting body.

3,614,662

LASER WITH A MONOCRYSTALLINE YA10 :N ACTIVE MEDIUM

Roch R. Monchamp, Waltham; Marvin J. Weber, Wayland, and Michael Bass, Lexington, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Dec. 19, 1969, Ser. No. 886,617
Int. Cl. H01s 3/16
U.S. Cl. 331—94.5 **11 Claims**

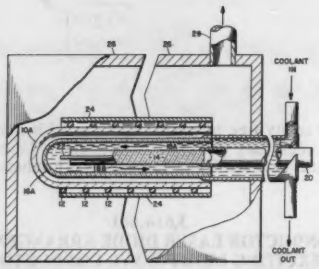


Nd^{+3} ions serve as a dopant in monocrystalline $YA10_3$ forming an active solid-state lasing medium.

3,614,663
BLACK-BODY-PUMPED LASER

Paul N. Palanos, Glendora, Calif., assignor to North American Rockwell Corporation

Filed Nov. 26, 1965, Ser. No. 509,804
Int. Cl. H01s 3/00
U.S. Cl. 331—94.5 8 Claims

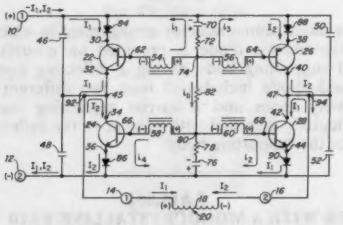


The laser is submerged in a black body cavity, the black body being maintained at a temperature at which its radiations include the frequency spectrum required to pump the laser. In this arrangement, the laser absorbs—from this frequency spectrum—the frequencies required to pump it; and the unused black body radiations are reabsorbed by the black body cavity, to be later reradiated. Thus, they are not wasted; and a high-efficiency laser arrangement is produced.

3,614,664
CLASS C BRIDGE OSCILLATOR

Donald W. Shute, Burlington, Mass., assignor to Spacetac Incorporated, Burlington, Mass.

Filed July 8, 1970, Ser. No. 53,233
Int. Cl. H03b 5/14; H03k 3/30
U.S. Cl. 331—110 11 Claims

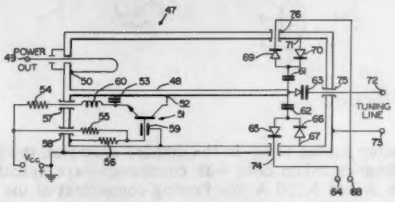


An oscillator bridge circuit including a pair of input terminals adapted for connection to a direct current source; two pairs of semiconductor devices, the two devices of each pair being connected with their load electrodes in series between the first and second input terminals and the junctions between each of the devices in a pair forming a pair of output terminals; a transformer having a primary winding connnected across the pair of output terminals and having feedback windings; four capacitors one connected across the load terminals of each of the devices; and means for applying biases between a load electrode and control electrode of each device for alternately switching on one device in each pair to apply the direct current source voltage across the pair of output terminals in alternating polarity; the means for applying including a control circuit which includes the one of the feedback windings connected to the control electrode of each of the devices for applying the voltage induced therein to alternately switch on the devices at the resonant frequency of the bridge circuit as substantially determined by the transformer primary inductance and the four capacitors.

3,614,665
VOLTAGE-CONTROLLED OSCILLATOR WITH DIGITAL PRESET

Carroll E. Weller, and Robert J. McNair, both of Cincinnati, Ohio, assignors to Avco Corporation, Cincinnati, Ohio

Continuation of application Ser. No. 713,943, Mar. 18, 1968, now abandoned. This application Apr. 6, 1970, Ser. No. 25,928
Int. Cl. H03b 5/18
U.S. Cl. 331—101 3 Claims

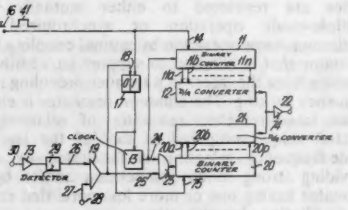


This is a voltage-controlled oscillator. The tank circuit of the oscillator comprises a plurality of capacitors, the capacitance magnitudes of which are related to each other in binary fashion. Also incorporated in this tank circuit is a voltage variable capacitor, to which a bias is applied for tuning purposes. By programmed switching one or more of the aforementioned capacitances are switched into the tank circuit, so as to bring the oscillator within the pull-in range of a phase lock loop. The elements of the oscillator are related to a coaxial line structure. The invention further provides a convenient mounting on which the tank circuit parameters are arranged. The various lumped capacitances in the tank circuit are switched in and out by PIN diodes.

3,614,666
TUNING A VARIABLE OSCILLATOR

Jean Louis Ribour, La Celle Saint-Cloud, and Francois Emile Clement Denise, Palaiseau, both of France, assignors to International Standard Electric Corporation, New York, N.Y.

Filed May 28, 1970, Ser. No. 41,336
Claims priority, application France, May 29, 1969, 69 17509
Int. Cl. H03j 3/18
U.S. Cl. 331—177 V 10 Claims

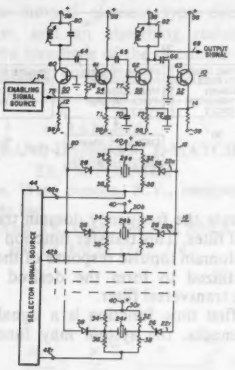


In a system for automatically tuning a ringing circuit, the voltage vs frequency curve of the ringing circuit is incrementally scanned and compared to a reference voltage. The frequency increments are made twice as large in that portion of the curve above said reference via a second incremental means. When the curve passes its maximum and returns to the reference voltage, the second means is disabled, reducing the frequency interval by one-half thus setting a frequency which corresponds to the maximum of said curve.

3,614,667
SWITCHABLE AND MODULATORY CRYSTAL OSCILLATOR

Martin W. Fletcher, Palo Alto, Calif., assignor to Itek Corporation, Lexington, Mass.

Filed Mar. 19, 1964, Ser. No. 353,082
Int. Cl. H03c 3/28
U.S. Cl. 332—26 6 Claims

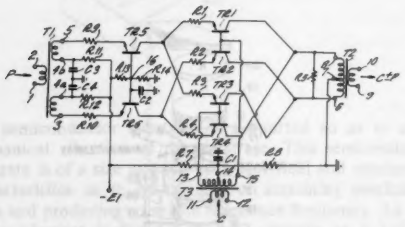


6. Apparatus for pulse modulating a crystal oscillator comprising: a transistor amplifier; a plurality of parallel feedback paths connected to said amplifier, each said feedback path including a crystal having a different resonant frequency; switch means associated with each of said feedback paths, each said switch means normally open to disconnect each of said feedback paths from said amplifier; means for applying a pulse modulating signal to at least the base electrode of one transistor forming one stage of said amplifier to render it conductive; gain control means connected to the stage of said amplifier to which said pulse-modulating signal is applied for providing maximum gain in said amplifier when said amplifier is first rendered conductive and for decreasing this gain thereafter; and means for applying successive switching signals to said switch means, one at a time, to thereby connect different ones of said feedback paths to said amplifier, whereby an output signal of the frequency of the crystal associated with the connected feedback path is generated.

3,614,668
DOUBLE-BALANCED MODULATORS OF THE CURRENT SWITCHING TYPE

Toshiaki Sudoh, Tokyo, Japan, assignor to Nippon Electric Company, Limited, Tokyo, Japan

Filed Feb. 13, 1970, Ser. No. 11,212
Int. Cl. H03c 1/54, 3/26
U.S. Cl. 332—24 10 Claims

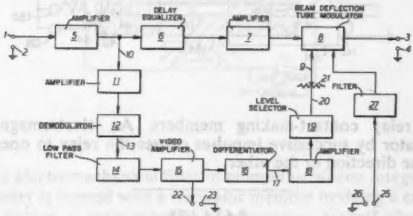


A double-balanced modulator for modulating a carrier with an input signal. A pair of balanced amplifiers each are arranged to modulate a carrier signal with an input signal during alternating half-wave periods of the carrier. The input signal is coupled to the pair of balanced amplifier-modulators by means of a constant current driver circuit which applies operating current in alternating fashion to the pair of balanced amplifier-modulators whereby only that modulator which is operating during any given half cycle receives operating current so as to produce a modulated carrier which is substantially free of unwanted harmonics and is therefore substantially distortion-free.

3,614,669
ECHO EQUALIZATION AND CHRISPENING OF TV SIGNALS WITHOUT SIGNAL DEMODULATION

Eric John Gargini, West Drayton, England, assignor to Communications Patents Limited

Filed May 8, 1968, Ser. No. 727,436
Claims priority, application Great Britain, May 25, 1967, 24398/67
Int. Cl. H03c 1/06
U.S. Cl. 332—37 7 Claims

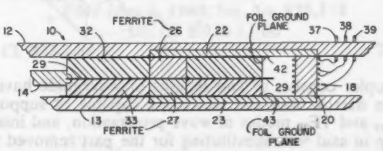


Distortion of an amplitude-modulated television signal being transmitted through a communication network is minimized by deriving a modulation component from the signal and then the modulated signal is modulated by the derived modulation component without demodulating the signal.

3,614,670
SWITCHABLE MICROWAVE CIRCULATOR WHEREIN GROUND PLANES ARE COMPRISED OF FOILS HAVING VERTICALLY CONDUCTIVE PARTICLES

Richard G. Wilson, San Jose, Calif.

Filed Nov. 5, 1969, Ser. No. 874,191
Int. Cl. H01p 1/32, 5/12
U.S. Cl. 333—1.1 5 Claims



A switchable microwave circulator having ground planes comprised of thin sheets of electrical insulation that have a coating of minute separate aluminum particles on one side that provides a continuous conductive path to microwaves and a resistive path to low frequency currents. The resistance of the coating eliminates induced currents that would otherwise flow around the driving members and pole pieces of the circulator during fast switching of the circulator and would slow the switching of the circulator.

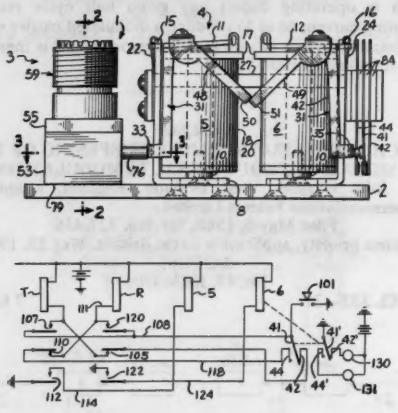
3,614,671
COAXIAL RELAY

Herbert D. Steinback, Chicago, Ill., assignor to Magnecraft Electric Co., Chicago, Ill.

Filed Oct. 22, 1965, Ser. No. 502,680
Int. Cl. H01p 1/10, 5/12
U.S. Cl. 333—7 3 Claims

A coaxial relay that approximates a coaxial conductor, the relay contact-making members being mounted on the cover

of a housing. The housing has a small adjustment towards and from the contacts, and there is an opening in the housing for observing the location of the housing walls with respect to



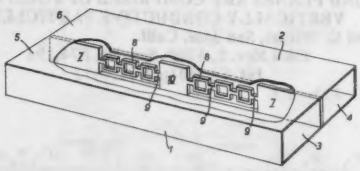
the relay contact-making members. An electromagnetic operator by successive impulses causes the relay to operate in one direction or the other.

3,614,672

WAVEGUIDE COUPLERS

Roderick Edward Newbould, Chelmsford, England, assignor to The Marconi Company Limited, London, England

Filed June 5, 1970, Ser. No. 43,851
Claims priority, application Great Britain, June 13, 1969, 30,037/69
Int. Cl. H01p 5/14; H03h 7/02, 7/04
U.S. Cl. 333—10 **15 Claims**



A coupler consists of two lengths of waveguide having a common narrow wall and which are capable of supporting the TE_{10} and TE_{20} modes of wave propagation, and inserted in a gap in said wall substituting for the part removed from the gap, a reactive structure having elements resonant at a predetermined operating frequency and situated in succession along the guide. The coupler can be used as a simple coupler when the elements are constituted by three closed rings and couple energy fed in at the input of one guide into the other guide or as a diplexer when there are six rings and energies at two different frequencies are fed to the input ends of the guides.

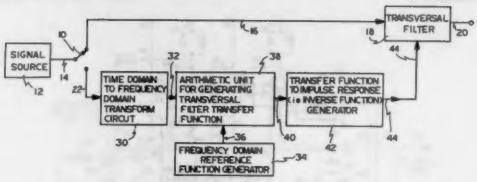
3,614,673

TECHNIQUE FOR UTILIZING A SINGLE PULSE TO SET THE GAINS OF A TRANSVERSAL FILTER

George Su Kang, Silver Spring, and Robert Lewis Goodwin, Rockville, both of Md., assignors to The Bunker-Ramo Corporation, Oak Brook, Ill.

Filed May 28, 1970, Ser. No. 41,363
Int. Cl. H04b 3/04
U.S. Cl. 333—18 **23 Claims**

A system for utilizing a single pulse having initially known characteristics to set the tap weights of a transversal filter to convert a first time function applied to the filter input into a second time function at the filter output. The pulse as it appears at the system input is converted into a first representation in the frequency domain and is mathematically operated upon, in conjunction with a generated second representation in the frequency domain of the pulse as it is desired that it appear at the output from the


SIGNAL SOURCE
TIME DOMAIN TO FREQUENCY DOMAIN TRANSFORM CIRCUIT
ARITHMETIC UNIT FOR GENERATING TRANSVERSAL FILTER TRANSFER FUNCTION
TRANSFER FUNCTION TO IMPULSE RESPONSE (or INVERSE FUNCTION) GENERATOR
TRANSVERSAL FILTER
FREQUENCY DOMAIN REFERENCE FUNCTION GENERATOR

filter, to generate the frequency domain transfer function of the transversal filter. This transfer function is then converted into the time domain inpulse response of the filter which may be directly utilized to form the desired set of weighting factors for the transversal filter.

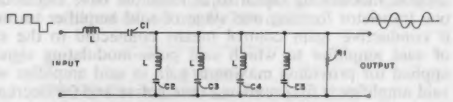
When the first time function is a signal received over a transmission media, the system may function as a media equalizer.

3,614,674

FILTER APPARATUS

John Dan Hill, III, Dallas, Tex., assignor to Collins Radio Company, Dallas, Tex.

Filed Aug. 6, 1970, Ser. No. 61,558
Int. Cl. H03h 7/04; H03k 5/01
U.S. Cl. 333—20 **3 Claims**



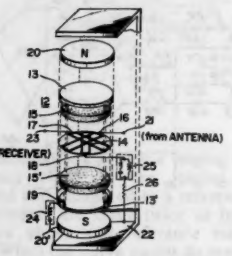
A filter designed in accordance with Laplace Transform theory and then approximated to a realizable filter having an impulse response of one-half cycle of a cosine wave.

3,614,675

ISOLATOR COMPRISING TUNED LUMPED ELEMENT CIRCULATOR

Yoshihiro Konishi, Sagamihara City, Japan, assignor to Nippon Hoso Kyokai, Tokyo, Japan

Filed Sept. 22, 1969, Ser. No. 859,751
Claims priority, application Japan, Oct. 2, 1968, 85,346/68
Int. Cl. H01p 1/32
U.S. Cl. 333—24.2 **10 Claims**



The present invention relates to an isolator having a low forward direction loss over a very wide frequency range and

a sufficiently high backward loss in a desired frequency range, and having a very compact configuration and a simple construction.

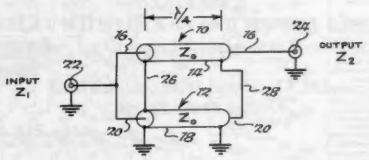
The isolator according to the present invention comprises a lumped element type circulator which is operative in the desired frequency range, a resonant circuit having its impedance characteristics to be at low impedance in said frequency range and to be at high impedance outside of said frequency range and being connected between outer conductor of the lumped element type circulator and a ground conductor, and an absorbing resistor connected between one of the terminals of the circulator and the outer conductor or the ground conductor.

3,614,676

BROADBAND IMPEDANCE-MATCHING TRANSFORMER

Gilbert L. Boelke, West Seneca, N.Y., assignor to Sylvania Electric Products Inc.

Filed Aug. 15, 1969, Ser. No. 850,470
Int. Cl. H03h 7/38, 7/42
U.S. Cl. 333—26 3 Claims



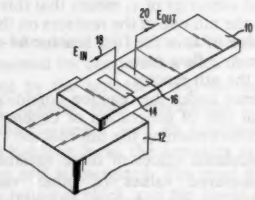
A balun transformer in which the characteristic impedance of each of its component transmission lines is selected to cause that line to function as a quarter wave transformer for providing an impedance transformation ratio for the balun which is other than an integral square.

3,614,677

ELECTROMECHANICAL MONOLITHIC RESONATOR

Raymond J. Wilfinger, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 29, 1966, Ser. No. 546,310
Int. Cl. H03h 9/04, 9/24
U.S. Cl. 333—71 24 Claims



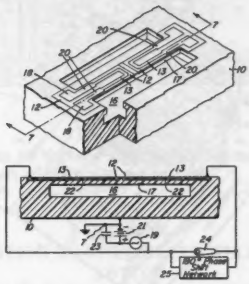
A semiconductor substrate is supported so as to allow mechanical vibration of the substrate. This semiconductor substrate is of a size and has such electrical and mechanical characteristics as to be capable of sustaining mechanical stress and producing a useable resonance frequency. An excitation element is formed in the substrate at a suitable location to cause mechanical strain in the semiconductor substrate by a thermal expansion mechanism. The further addition of a device formed in the semiconductor substrate for converting mechanical stresses in the semiconductor substrate into electrical phenomena makes the semiconductor device of even greater value.

3,614,678

ELECTROMECHANICAL FILTERS WITH INTEGRAL PIEZORESISTIVE OUTPUT AND METHODS OF MAKING SAME

William E. Engeler, Scotia, and Marvin Garfinkel, Schenectady, both of N.Y., assignors to General Electric Company

Filed Aug. 11, 1967, Ser. No. 660,078
Int. Cl. H03h 9/00
U.S. Cl. 333—72 27 Claims



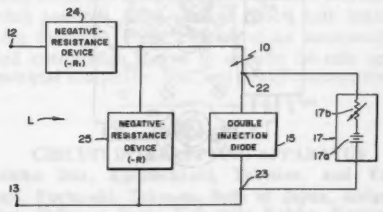
An electromechanical filter in monolithic silicon integrated circuitry is formed with a resonator member bridging a cavity and having a strain-sensitive piezoresistive pickoff element formed therein. When the resonator member is driven electrostrictively, capacitively, electromagnetically, magnetostrictively or magnetically, an AC output signal is provided by the pickoff element at a frequency dependent upon the mechanical characteristics of the member. The filter is fabricated by burying a silicon nitride slab within an epitaxially formed crystal and thereafter first etching out a pair of regions to define the sides of the resonant member and next etching away the silicon nitride slab to form a cavity beneath the resonator member.

3,614,679

DOUBLE INJECTION INDUCTOR

Marc-Aurele Nicolet, Pasadena, Calif., and Hans Rudolf Bilger, Stillwater, Okla., assignors to California Institute of Technology, Pasadena, Calif.

Filed June 2, 1969, Ser. No. 829,518
Int. Cl. H03h 11/00
U.S. Cl. 333—80 T 7 Claims

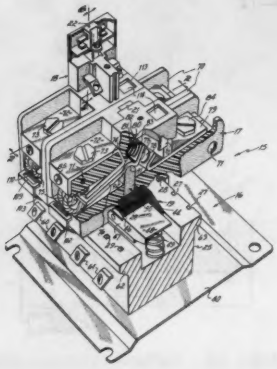


A circuit, incorporating a variably bistable double-injection diode to provide a high Q inductance, is disclosed. The circuit's inductance is the inductance exhibited by the double-injection diode, which is a function of the diode's biasing potential. The high Q property is realized by incorporating in the circuit devices or circuits which provide negative resistances to compensate for the positive resistive characteristics of the double-injection diode.

3,614,680
MULTIPOLE SWITCHING MECHANISM

John L. Haydu, Owings Mills, and Bernard Coleman, Westminster, both of Md., assignors to Rowan Controller, Inc., Westminster, Md.

Filed Feb. 11, 1970, Ser. No. 10,378
Int. Cl. H01h 50/04
U.S. Cl. 335—132 16 Claims

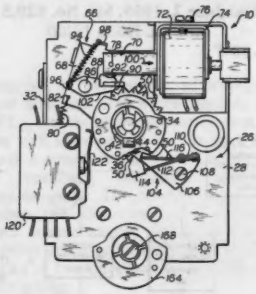


A switching mechanism for multipole operation having a base and having up to four contact-carrying modules symmetrically mounted on the base, the modules being simultaneously operable by electromagnets for use as a contactor or operable by a lever for use as a disconnect switch, the module being adapted to receive auxiliary contact blocks operated in tandem with the contacts of the main module.

3,614,681
SELECTIVELY VARIABLE COIN CONTROL APPARATUS

Harry Greenwald, Whitestone, and Dennis J. Larkin, West Hempstead, both of N.Y., assignors to Greenwald Industries, Inc., Brooklyn, N.Y.

Filed Nov. 7, 1969, Ser. No. 874,866
Int. Cl. H01h 51/08
U.S. Cl. 335—140 13 Claims

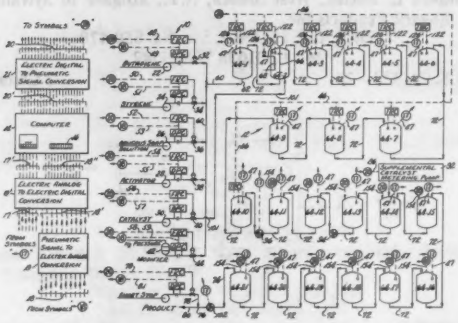


A coin-operated selectively variable control apparatus is adapted to be used with a coin-receiving device which produces a respective signal corresponding to the deposit of each coin therein. The apparatus comprises a support which rotatably mounts an operating device. Stepping means responsive to the aforementioned signals is adapted to rotate the operating means through a preselected arc in response to each of such signals received. At least one switch is mounted on the support and is adapted to be connected in an electric circuit with the controlled device. Switch-actuating means is selectively positionable on the operating means for operating the switch in response to the rotation of the operating means through a predetermined arc as determined by the position of the switch-actuating means on the operating means.

3,614,682
DIGITAL COMPUTER CONTROL OF POLYMERIZATION PROCESS

Robert C. Smith, Houston, Tex., assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation of application Ser. No. 434,845, Feb. 24, 1965, now abandoned. This application June 22, 1970, Ser. No. 48,954
Int. Cl. G06f 15/46
U.S. Cl. 235—151.12 4 Claims



Changes in component concentration, heat history, and other variables which cannot be directly measured in the successive reactors in a train of polymerization reactors, are followed by periodically numerically integrating, by a digital computer, for each reactor and for each of the variables, the equation

$$\frac{dx_{i,n}}{dt}=\frac{F}{V}(x_{i,n-1}-x_{i,n})+\frac{\partial x_{i,n}}{\partial t} \quad (1)$$

where

x = a process variable, e.g., concentration, conversion, etc.

i, as the first subscript of x, signifies that this is the ith of I variables

n, as the second subscript of x, means that this is the value of the variable in the nth one of the reactors on the line—thus $x_{i,1}$ means the value of x_i in the first reactor 64–1 etc.

F = total volumetric flow rate

V = volume of the nth reactor

t = time difference under the reaction conditions

$\partial x_{i,n}/\partial t$ = overall rate of generation or degeneration of $x_{i,n}$ under the conditions obtaining the nth reactor

The resultant calculated values of these variables, together with directly measured values of other variables, are manipulated by the computer and used to adjust the rate of feed of reagents and other conditions of polymerization in the train.

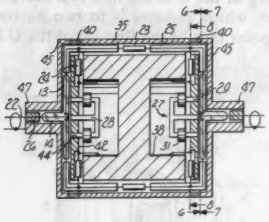
3,614,683
MULTIPLE-CONTACT GLASS-SEALED DRY REED SWITCHING DEVICE

David Lee Porter, Buena Park, Calif., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed Oct. 29, 1968, Ser. No. 771,494
Int. Cl. H01h 51/28
U.S. Cl. 335—152 2 Claims

A multiple-contact magnetic glass-sealed dry reed switch has a plurality of radial reeds which are selectively operated

to engage or disengage a central disc contact. The reeds and the disc contact are contained within a single sealed envelope



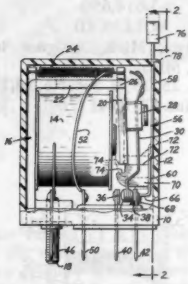
or vessel. Pairs of these dry reed switches are utilized to selectively connect attenuator networks in a variable coaxial line attenuator.

3,614,684

RELAY WITH LOCK-IN AND MANUAL RESET

Joseph J. Egler, La Grange, Ill., assignor to Guardian Electric Company

Filed Feb. 26, 1970, Ser. No. 14,383
Int. Cl. H01h *9/20*
U.S. Cl. 335—166 **2 Claims**



A relay is comprised of a terminal block with a coil, an armature mounted for cooperation with the coil, at least one pole operated by the armature, and the improvement of a lock-in and manual reset mechanism. The mechanism includes a reset member with an attached stud. The stud engages and holds or locks the armature in a fixed position whenever the coil is energized. The reset member is biased between the terminal block and the cover of the relay and may be manually displaced against the biasing force to release or unlock the armature.

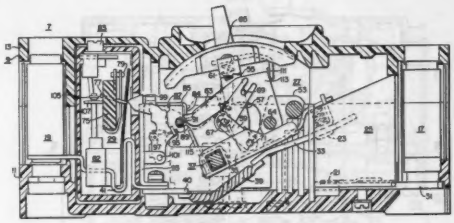
3,614,685

CIRCUIT BREAKER WITH HANDLE-INDICATING MEANS

James P. Ellsworth, and Robert H. Flick, both of Beaver, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 6, 1970, Ser. No. 9,370
Int. Cl. H01h *9/20, 1/52*
U.S. Cl. 335—166 **8 Claims**

An improved circuit breaker comprises means operating, when the contacts are welded closed and the trip member is released, to block the trip member against movement to a resetting position and to maintain the operating handle in the



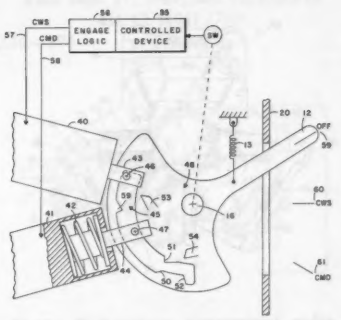
closed position to thereby provide a true indication of the closed condition of the breaker contacts.

3,614,686

MULTIPOSITION MAGNETICALLY HELD FAIL-SAFE SWITCH

David W. Ellis, Costa Mesa, Calif., assignor to Collins Radio Company, Cedar Rapids, Iowa

Filed Sept. 2, 1970, Ser. No. 69,072
Int. Cl. H01h *9/20*
U.S. Cl. 335—167 **12 Claims**



A concept of multiposition magnetically held fail-safe switching employs a control solenoid for each successive pair of switch positions. Each solenoid effects both holding and blocking functions under control of an associated logic-enabled energization source to achieve fail-safe operation with minimal complexity, cost, and power consumption.

3,614,687

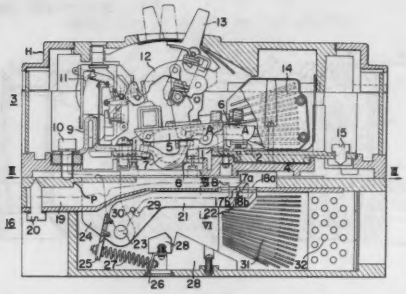
CIRCUIT INTERRUPTING APPARATUS

Masachika Iida, Kunitachi-shi, Tokyo-to, and Yasutaka Imajo, Fuchu-shi, Tokyo-to, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki-shi, Japan

Filed Aug. 22, 1969, Ser. No. 852,355
Claims priority, application Japan, Aug. 28, 1968, 61186
Int. Cl. H01h *77/10*
U.S. Cl. 335—195 **3 Claims**

A so-called no-fuse circuit breaker of a predetermined interrupting capacity is integrally combined with a current limiting circuit interrupter with contacts which are opened by electromagnetic force and having a larger interrupting capacity then the no-fuse circuit breaker. Overcurrents within the interrupting capacity of the no-fuse circuit breaker

are interrupted by the same whereas overcurrents exceeding said interrupting capacity are interrupted by the current-

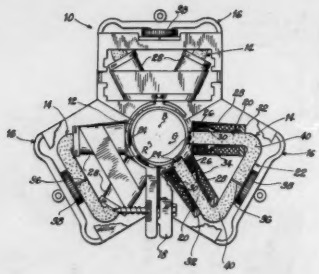


limiting circuit interrupter before the no-fuse circuit breaker operates.

3,614,688
CONVERGENCE UNIT FOR COLOR TELEVISION PICTURE TUBE

Albert M. Anthony, Conneaut, Ohio, assignor to Tracor, Inc., Austin, Tex.

Filed June 15, 1970, Ser. No. 46,311
Int. Cl. H01f 7/00
U.S. Cl. 335—210 **7 Claims**



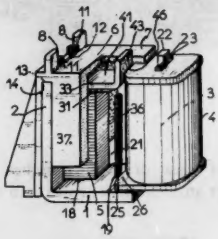
The illustrated convergence unit comprises three generally triangular cores adapted to be mounted around the neck of a color television picture tube at equal angular intervals. Each core comprises two legs directed inwardly toward the central axis of the tube, and crossbar means extending between the outer end portions of the legs. As to each core, the legs and the crossbar means form a triangular shape. The legs are positioned substantially along radii which extend outwardly from the central axis. Horizontal and vertical convergence coils are mounted on the legs. The triangular shape of the cores increases the efficiency of the coils. Moreover, the legs are brought into closer proximity to the three electron beams of the picture tube.

3,614,689
TRIPPING DEVICES

Paul A. G. Canonne, Chelles, France, assignor to L'Industrie Electrique De La Seine, Seine-Saint-Denis, France

Filed Nov. 7, 1969, Ser. No. 875,214
Claims priority, application France, Jan. 6, 1969, 6900052
Int. Cl. H01f 7/08
U.S. Cl. 335—229 **17 Claims**

A high sensitivity and high-fidelity tripping device, comprises a magnetic circuit of U-shape with a coil on one of the legs of the U and a permanent magnet housed in the U adjacent the second leg of the U such that one pole lies against the base of the U. A plate of nonmagnetic material is secured to the second leg of the U, and an armature is normally held magnetically on the two legs of the U and is releasable under spring action by rocking on the second leg of the U between two projections of the plate. The polar face of the second leg of the U is cut into two sections by a wide, central channel, which reduces it to two narrow, separated teeth, and the polar face of the first leg of the U is reduced to

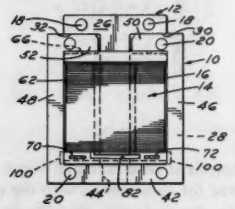


a narrow tooth between two shoulders; a regulating screw of magnetic material is screwed into the base of the U, parallel to the legs of the U, between the coil and the permanent magnet; and a flux collector, of magnetic material has a flat part located through the intermediary of a plate of nonmagnetic material on the free end of the permanent magnet and is arrested at a short distance from the second leg of the U and also has a part turned upwards towards the armature and arrested at a short distance from the armature.

3,614,690
SOLENOID

David C. Jencks, Troy, Mich., assignor to Detroit Coil Company, Ferndale, Mich.

Filed Feb. 25, 1970, Ser. No. 14,113
Int. Cl. H01f 7/10
U.S. Cl. 335—250 **10 Claims**



The coil bobbin which is received within the stator is provided with a pair of end flanges, one of which is shaped to define a pair of catches which are depressed when the bobbin is inserted in the stator, and when the bobbin is in its proper position the catches spring out to retain the bobbin in operating position.

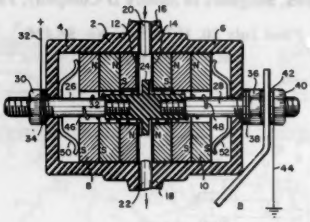
3,614,691
DEVICE FOR TREATING HYDROCARBON FUEL

Saburo Miyata, 19-47, Takanawa 3-chome Minato-ku, Tokyo, Japan

Filed Sept. 19, 1969, Ser. No. 859,434
Int. Cl. H01f 7/02
U.S. Cl. 335—306 **10 Claims**

A device for treating hydrocarbon fuel to improve combustion thereof in an internal combustion engine. A pair of permanent magnets are supported in a casing with like poles facing each other and separated by a small gap. The

spaced faces of the magnets are connected to opposite poles of a source of electricity to superimpose an electrostatic field



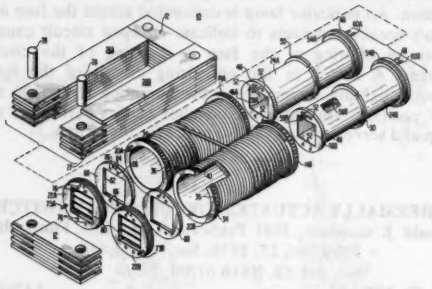
in the space between the magnets. A pair of conduits are connected to the casing to conduct the fuel through the gap.

3,614,692

VARIABLE INDUCTION DEVICE

Donald S. Rozelle, Owego, N.Y.; Ralph B. Rozelle, Forty Fort, and Umid R. Nejib, Edwardsville, Pa., assignors to Magnetech Industries, Inc., Montrose, Pa.

Filed June 2, 1970, Ser. No. 42,703
Int. Cl. H01f 21/04
U.S. Cl. 336—15 13 Claims



The disclosure relates to a variable induction device or transformer of the type comprising a rectangular magnetic core having two primary transformer windings on opposite core legs and a transferable secondary winding carried by a pair of axially rotatable drums which are each mounted in telescoping relationship over an associated one of the primary transformer windings. Each drum carries a portion of the secondary winding, and the portions are connected in series opposition. The turns of the transferable secondary winding may be transferred from one drum to the other by rotating the drums in synchronism, thereby varying the effective number of transformer secondary turns. A fixed secondary winding or coil having a predetermined number of fixed turns is provided on one of the drums, and electrical connections are made to the windings on the drums by way of an induced current-cancelling commutator. All of the elements comprising the variable induction device are removably mounted and one of the core end members is removable to provide interchangeability of the elements.

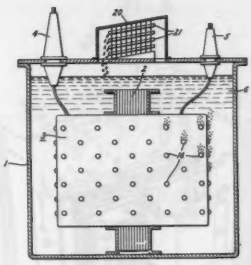
3,614,693

LIQUID COOLING OF ELECTRICAL APPARATUS

Langdon T. Frey, III, Newton, N.C., assignor to General Electric Company

Filed Nov. 4, 1970, Ser. No. 86,764
Int. Cl. H01f 27/10
U.S. Cl. 336—58 5 Claims

A power transformer having its main high-power windings encapsulated in a cast body of epoxy resin is filled with a dielectric cooling liquid having a boiling point slightly above the normal full load operating temperature of the cast coil assembly. To enhance cooling of the coil by the ambient liquid heat-conducting pins embedded in the windings extend



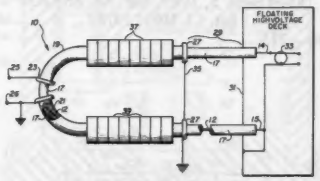
to the outer surface of the coil assembly and have exposed surface areas sufficiently small to exceed the vaporization temperature of the liquid. Consequently bubbling from these boiling sites enhances heat transfer over substantially the entire coil surface.

3,614,694

COAXIAL CABLE HIGH-VOLTAGE PULSE ISOLATION TRANSFORMER

Roland F. Koontz, Menlo Park, Calif., assignor to The United States of America as represented by the United States Atomic Energy Commission

Filed Sept. 17, 1969, Ser. No. 858,818
Int. Cl. H01f 17/06
U.S. Cl. 336—174 6 Claims



A one-to-one high-voltage nanosecond pulse isolation transformer formed from a single length of solid dielectric coaxial cable bent into a U-shape with the outer sheath separated at the midpoint of the "U" and with the outer ends of the sheath electrically interconnected. Input connections are made to the separated sheaths at the midpoint of the "U" and output connections are made across the ends of the center conductor at the ends of the "U." Ferrite cores are stacked over the sheath on each leg of the "U" to prevent input pulses from flowing in the sheaths and being shorted by the connection between the sheaths.

3,614,695

INDUCTIVE APPARATUS WITH MAGNETIC LOCKING PLATES

Selwyn Palmer, Waterdown, Ontario, Calif., assignor to Canadian Westinghouse Company, Limited, Hamilton, Ontario, Calif.

Filed Sept. 24, 1970, Ser. No. 75,216
Int. Cl. H01f 27/26
U.S. Cl. 336—210 4 Claims

Electrical inductive apparatus including a magnetic core constructed of stacked-magnetic laminations arranged to provide a plurality of spaced-leg portions, the adjacent ends of which are joined by first and second yoke portions. Yoke

clamps are disposed to hold the first and second yoke portions in assembled relation, and a plurality of lock plate members are disposed against the leg portions. The lock

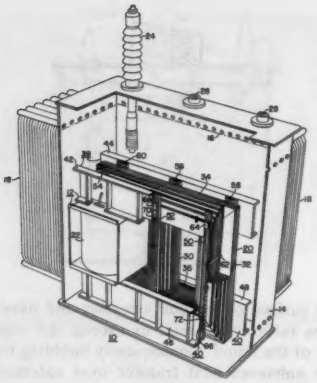


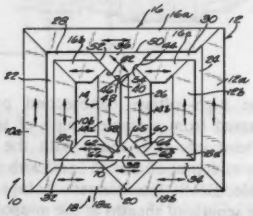
plate members, which mechanically link the yoke clamps, are constructed of a plurality of magnetic laminations whose major surfaces are disposed perpendicular to the major surfaces of the laminations in the leg portions.

3,614,696

LAMINATION CONSTRUCTION FOR TRANSFORMER CORE AND CORE INCLUDING SAME

James D. Douglass, Pittsburgh, and Albert T. Chase, Bethel Park, both of Pa., assignors to McGraw-Edison Company, Elgin, Ill.

Filed Sept. 5, 1969, Ser. No. 855,635
Int. Cl. H01f *27/24*
U.S. Cl. 336—215 **10 Claims**



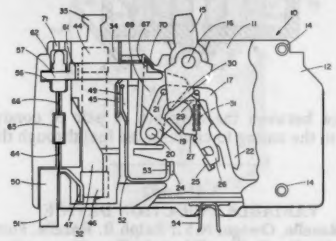
A triangular-shaped segment is arranged at each joint between the inner leg and the yokes of a split magnetic transformer core. The triangular segments have a corner directed inwardly toward the inner leg and present two angularly related edges, i.e., on both sides of the corner, to the inner leg. These angularly related triangular segment edges abut complementary angled edges in the center leg. The grain orientation of the triangular segments is disposed at an angle of 45° to the grain orientation of both the inner leg and the yokes and perpendicular to the butt connection between the triangular segment and the inner leg. These triangular segments are offset relative to each other and with respect to the inner leg. One of the triangular segments engages an additional triangular-shaped segment provided in one of the yokes and the dimension between the inwardly facing corner and the opposite triangle segment edge abutting a yoke segment is different for both of the triangular segments.

3,614,697

MOLDED CASE ELECTRIC CIRCUIT BREAKER WITH FUSE AND INDICATOR LAMP

Robert W. Dunham, and Charles D. Vyskocil, both of Cedar Rapids, Iowa, assignors to Square D Company, Park Ridge, Ill.

Filed July 26, 1970, Ser. No. 56,426
Int. Cl. H01h *85/00*
U.S. Cl. 337—6 **5 Claims**



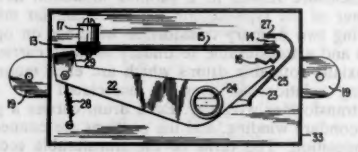
A circuit breaker is provided with a current-limiting fuse mounted in a removable fuse holder and electrically connected in series with the circuit breaker contacts. A self-biasing mechanical interlock member prevents insertion or removal of the fuse unless an operating lever is in the OFF position. An indicator lamp is connected across the fuse and circuit breaker contacts to indicate an open circuit caused either by blowing of the fuse or tripping of the circuit breaker. A switch in the energizing circuit of the lamp prevents lighting thereof when the operating lever is in the OFF position. The interlock member carries current to the lamp and serves as a movable contact for the switch.

3,614,698

THERMALLY ACTUATED CIRCUIT DELAY SWITCH

Donald J. Gardner, 3741 Penbrook Lane #13, Flint, Mich.

Filed Oct. 27, 1970, Ser. No. 84,416
Int. Cl. H01h *61/00, 71/16*
U.S. Cl. 337—81 **4 Claims**



A switch for lighting fixtures and the like which provides either immediate opening of the circuit when actuated or optionally a delayed opening by means of a bimetallic thermal element responsive to a thermistor.

3,614,699

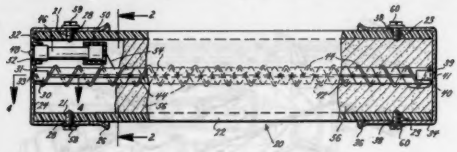
PROTECTOR FOR ELECTRIC CIRCUITS

Aloysius J. Fister, St. Louis, Mo., assignor to McGraw-Edison Company, Elgin, Ill.

Filed Aug. 10, 1970, Ser. No. 62,414
Int. Cl. H01h *85/30*
U.S. Cl. 337—244 **9 Claims**

A terminal of an electric power-supplying fuse has an opening therein and has an annular mounting surrounding that opening; and that annular mounting supports, in cantilever fashion, the indicator-bearing terminal of an indicating fuse. The other terminal of that indicating fuse is displaced radially outwardly of and out of engagement with

the fusible element of the power-supplying fuse. The indicating fuse is a wholly enclosed, complete subassembly



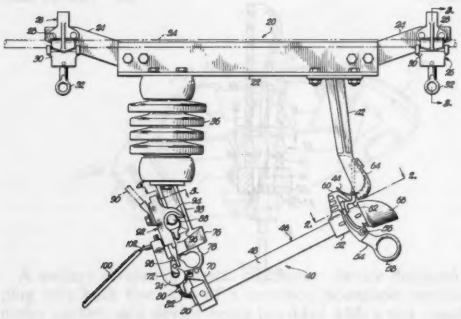
which is manufactured and tested, and is then assembled with said annular mounting on said terminal.

3,614,700

ON-THE-LINE DISTRIBUTION CUTOUT SWITCH

Lloyd R. Beard; Delmar E. McNaghten, and Charles A. Popeck, all of Centralia, Mo., assignors to A.B. Chance Company, Centralia, Mo.

Filed Apr. 25, 1969, Ser. No. 819,275
Int. Cl. H01h *31/00, 31/12, 31/34*
U.S. Cl. 337—203 6 Claims



A distribution cutout which is both electrically connected to a current-carrying line and mechanically connected thereto for support by the line without breaking the latter. The cutout is particularly adapted for use in overhead distribution circuitry where crossarms are not available as a support. The switch arm of the cutout comprises a tubular fuse holder from which a fuse link therewithin is ejected when a fault is encountered, a guard being provided which blocks the ejecting link to prevent the establishment of an arc between such link and the line. Both the head of the link and the frangible disc used to seal the fuse holder are captured by a vented retainer.

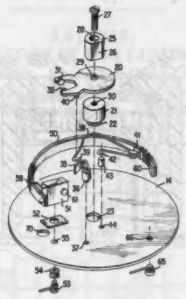
3,614,701

MANUALLY CONTROLLED DELAYED-ACTION POWER SWITCH

Donald J. Gardner, 3741 Penbrook Lane #13, Flint, Mich.

Filed Jan. 19, 1970, Ser. No. 3,826
Int. Cl. H01h *37/62*
U.S. Cl. 337—341 9 Claims

A manually controlled delayed-action power switch that an operator may position to cause immediate closing or opening of an electric circuit or alternatively set into motion a sequence of events which will cause the circuit to open after



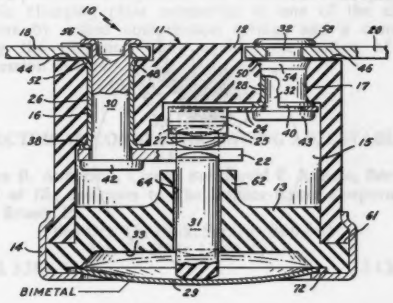
a predetermined delay effected by the properties of a thermal element.

3,614,702

TERMINAL-CONTACT RIVET CONSTRUCTION AND METHOD OF ASSEMBLY THEREOF

Walter S. Vargas, North Kingstown, R.I., assignor to Elmwood Sensors, Inc., Cranstan, R.I.

Filed Sept. 8, 1969, Ser. No. 855,809
Int. Cl. H01h *37/04, 37/52;* H01r *9/20*
U.S. Cl. 337—381 6 Claims



A terminal contact rivet construction for use in a thermostatic switch and including a sleeve that cooperates with a rivet for securing a terminal strip and contact element to the housing of said switch, said sleeve and rivet further acting to prevent loosening of the terminal strip and contact element upon expansion or contraction of the switch housing due to temperature differentials experienced in the operation of said switch.

3,614,703

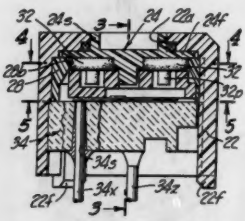
MINIATURE POTENTIOMETER WITH FRICTION WHEEL DRIVE

Ronald L. Froebe, Riverside, Calif., assignor to Bourns, Inc.

Filed Apr. 1, 1970, Ser. No. 24,689
Int. Cl. H01c *9/02*
U.S. Cl. 338—174 7 Claims

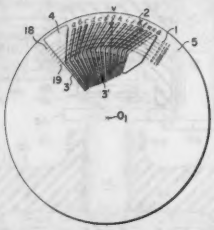
A miniature rotary potentiometer having an arcuate resistance element and a rotary contact movable through less than one complete turn or revolution in brushing over the active extent of the resistance element. The rotary contact is mounted upon a rotatable carrier which also carries the pivots of a plurality of friction planet wheels the peripheries of which frictionally engage and travel along a circular path

on the inner wall of the potentiometer housing and which peripheries are frictionally engaged by and driven by a small rotary spindle or hub carried by a tool-rotatable actuator disposed in the top or upper end of the potentiometer.



Rotation of the actuator frictionally rotates the friction planet wheels which through their pivots drive the carrier at reduced rotary speed relative to the actuator, whereby the actuator must be rotated several complete revolutions to drive the contact along the extent of the resistance element.

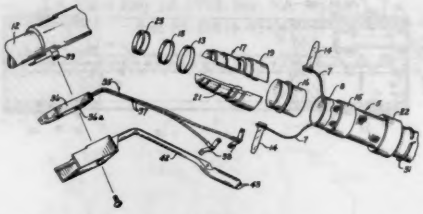
3,614,704
SLIDING MEMBER AND ELECTRODES FOR MEASURING INSTRUMENTS
Tatsuo Fujii, and Yutaka Watano, both of Tokyo, Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan
Filed Oct. 20, 1969, Ser. No. 867,542
Claims priority, application Japan, Oct. 23, 1968, 191932/1968
Int. Cl. H01c 9/04
U.S. Cl. 338—140 **1 Claim**



The invention includes tap electrodes comprising a plurality of resistance layers connected in series but different in width before and after the joint portions, and a sliding contacting member comprising a great number of small contacts. Either or both of the elongated directions of the electrodes and contacting member are relatively inclined. By this arrangement the variation in resistance is ideally stepwise and this stepwise variation is held stable regardless of the increase in the number of sliding operations of the slider.

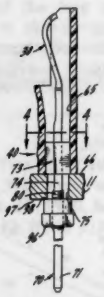
3,614,705
SYSTEM AND APPARATUS FOR ELECTRICALLY CONNECTING A VACUUM CLEANER AND A REMOTE MOTOR DRIVEN BRUSH TOOL
Raymond Descarries, Montreal; Paul E. Gaudry, Laval, Quebec, Canada, and B. Erik Ohlson, Stamford, Conn., assignors to Consolidated Foods Corporation, Chicago, Ill.
Division of Ser. No. 730,306, May 20, 1968, Pat. No. 3,534,317.
Filed Jan. 7, 1970, Ser. No. 6,005
Int. Cl. H01r 15/02
U.S. Cl. 339—8 R **1 Claim**

A vacuum cleaner hose having electric conductors and end fittings provided with electric terminals in which the fittings are removably connected with the hose by means of an uncured rubber ring clamped radially onto the hose by a pair of sleeves associated with the respective hose end fittings. One hose fitting is adapted for use as a handgrip and is provided with an electric terminal which automatically connects the hose conductors with the conductors of a



telescoping wand. The wand is provided with a sliding contact so that in any of its retracted and elongated positions current is conducted to the motorized brush tool removably attached to one end of the wand.

3,614,706
GROUND CONNECTOR
Frank A. Kukla, Cicero, Ill., assignor to Malco Manufacturing Company, Inc., Chicago, Ill.
Filed June 8, 1970, Ser. No. 44,191
Int. Cl. H01v 3/06
U.S. Cl. 339—14 R **8 Claims**

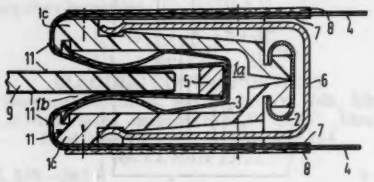


A ground connector assembly for connecting a terminal pin, with a wire-wrap post on one end, to a metal plate. The assembly includes a ground terminal of one piece construction made from flat sheet stock, having an integrally formed ground section including mounting means for seating on a metal plate and a shank which extends through a generally circular cylindrical aperture in a plate and is integrally threaded at its lower end to receive a locking nut which secures the terminal tightly to the plate. The configuration of the mounting means and the locking nut are such that the terminal is stabilized in perpendicular relationship to the plate and bites into the surface of the plate to provide excellent electrical contact between the terminal and the plate.

3,614,707
ELECTRICAL CONNECTOR
Kurt Kaufmann; Rudolf Jerney, and Franz Wandinger, all of Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich
Filed Oct. 6, 1969, Ser. No. 864,041
Claims priority, application Germany, Oct. 9, 1968, P 18 02 130.2
Int. Cl. H01r 13/50; H05k 1/07
U.S. Cl. 339—17 F **10 Claims**

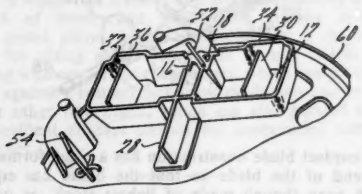
A plug in electrical connector for receiving the plug end of a printed circuit board. The connector includes a housing means having a receptacle for receiving the plug end of a

circuit board. The periphery of the receptacle is resilient for nonabrasively receiving the plug end of the printed circuit board and provides electrical contact with the plug end of the printed circuit board. A tension means is mounted in the housing means out of contact with the resilient peripheral boundaries of the receptacle urging the boundaries toward



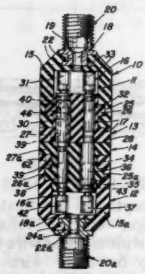
the plug end of the circuit board with a force sufficient to establish electrical contact between conductor paths extending along the receptacle and the conductor paths extending along the plug end of the circuit board. The connector is miniaturized and adapted to interconnect a plurality of circuits in an information storer to a plurality of circuits in a drive device without damage to such circuits.

3,614,708
METER DISCONNECT DEVICE
William S. Koepfgen, Southgate, Mich., assignor to Ekstrom Industries, Inc., Farmington, Mich.
Filed Sept. 11, 1969, Ser. No. 848,850
Int. Cl. H01r *13/44, 13/60*
U.S. Cl. 339—36 **7 Claims**



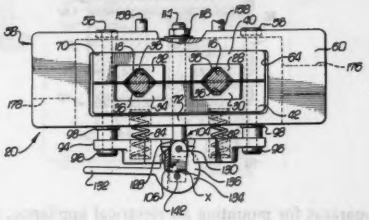
A unitary insulating plastic disconnect device designed to plug into both line jaws of a common household watthour meter socket; said device being provided with a slot capable of holding a meter by one blade and in a disconnected condition by reason of being rotated out of contact with said meter socket jaws.

3,614,709
ELECTRICAL CONNECTOR UNIT
Richard F. Schweihs, 640 S. Cornell, Villa Park, Ill.
Filed May 20, 1969, Ser. No. 826,123
Int. Cl. H01r *13/52, 13/54*
U.S. Cl. 339—63 R **4 Claims**



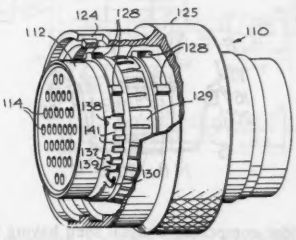
An electrical connector unit is provided for detachably attaching a thermocouple to an electrical instrument, or instrument panel, or the like, without the use of screws, or like fastening elements, and without the need for any tool other than a suitable soldering tool, preferably a soldering tool of the so-called pencil type.

3,614,710
BIPOST SOCKET FOR LUMINAIRES
Richard B. Glickmann, Sherman Oaks, Calif., assignor to Berkey/Colortran Mfg. Inc., Burbank, Calif.
Filed July 7, 1969, Ser. No. 839,386
Int. Cl. H01r *33/10*
U.S. Cl. 339—75 R **11 Claims**



The bipost socket structure comprises a pair of clamp members accommodated in a housing and mounted for limited movement toward and away from each other, conductive socket elements interfitting the clamp members and operable to close about posts of a lamp upon movement of the clamp members together, and a mechanism for moving the clamp elements together. The mechanism comprises a movable clamping plate connected to one of the clamp members by coiled compression springs and a cam for moving the clamping plate against the action of the compression springs.

3,614,711
ELECTRICAL CONNECTOR HAVING ADJUSTABLE KEYING
Norman R. Anderson, Cicero, and David F. Rundle, Berwyn, both of Ill., assignors to The Bunker-Ramo Corporation, Oak Brook, Ill.
Filed Oct. 15, 1969, Ser. No. 866,664
Int. Cl. H01r *13/64, 7/32*
U.S. Cl. 339—90 R **3 Claims**

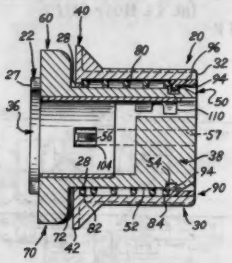


An electrical connector having adjustable keying and comprising a lockingly engageable plug and receptacle containing respectively mating pins and sockets. The receptacle includes a plurality of circumferentially spaced pluggable keyways which can be selectively plugged by a connector user to provide a keyway for the receptacle at any of a plurality of different possible locations. The plug has a rotatably movable key which a connector user can align with the selected keyway location provided in the receptacle.

3,614,712
APPLIANCE MOUNTING APPARATUS

Anthony J. Taormina, Detroit, and Roman J. Witek, Jr., Romulus, both of Mich., assignors to Essex International, Inc.

Filed May 9, 1969, Ser. No. 823,316
Int. Cl. H01r 13/32
U.S. Cl. 339—127 6 Claims

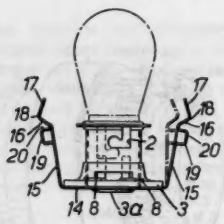


Apparatus for mounting an electrical appliance, such as a lamp, in a panel having an aperture located adjacent the perimeter of a center hole in the panel. The apparatus includes an inner shell that is movably mounted within a bore defined by an outer shell. A radial flange is connected to the outer shell and is adapted to engage a first side of the panel. A lug is connected to the inner shell and is adapted to fit through the aperture, so that it may engage a second side of the panel. A coil spring is retained between the outer shell and a retainer member that releasably engages the inner shell so that the apparatus is resiliently held in place on the panel. The electrical appliance is held within the inner shell by a socket.

3,614,713
ELECTRIC LAMPHOLDER

Clarence Willians Heath, Bleasby, England, assignor to TRW Inc., Cleveland, Ohio

Continuation of application Ser. No. 733,658, May 31, 1968, now abandoned. This application Mar. 9, 1970, Ser. No. 17,037/70
Claims priority, application Great Britain, June 1, 1967, 25244/67
Int. Cl. H01r 13/32
U.S. Cl. 339—128 2 Claims



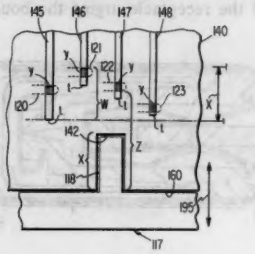
Lampholder comprising a metal shell having its inner end assembled in a bosslike recess on a base of insulating material, an electrical contact on the base extending into the recess for engaging the base contact on a lamp.

3,614,714
EDGE CONNECTOR WITH POLARIZING MEMBER

Bernard Silverstein, Philadelphia, Pa., assignor to RCA Corporation

Filed Nov. 21, 1969, Ser. No. 878,688
Int. Cl. H01r 13/64; H05k 1/07
U.S. Cl. 339—186 M 17 Claims

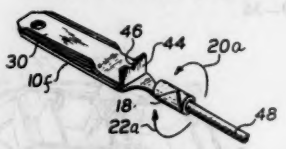
A connector having a socket for receiving the leading edge of a printed circuit board includes a polarizing and keying member adapted to engage an indexing slot adjacent the printed circuit board leading edge in a given direction. The engaging keying-indexing member and slot are disposed in the socket intermediate the socket bottom and the contact region of a contact element, permitting the contact element and the indexing-keying means to be aligned in the given direction.



3,614,715
CORDSET BLADE DESIGN

Walter H. Marx, Berkley Heights, N.J., assignor to General Cable Corporation, New York City, N.Y.

Filed July 25, 1969, Ser. No. 844,800
Int. Cl. H01r 13/06
U.S. Cl. 339—252 P 7 Claims

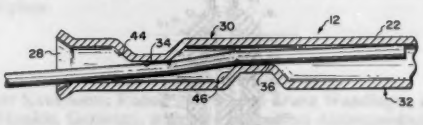


This cordset blade construction has a ridge formed in the prong end of the blade so that the blade has equivalent strength even though made of lighter stock, as compared with a heavier blade, and the blade is shaped to fit conventional outlets, even though the blade is thinner than conventional blades. The strain relief tab, on the end of the blade over which the insulation plug is to be molded, is notched to serve as a die for cutting through the insulation in an improved method for attaching the blade to an insulated conductor.

3,614,716
CONNECTOR RECEPTACLE WITH WIRE DEFORMING MEANS

Robert E. Jensik, Cicero, Ill., assignor to Chicago Miniature Lamp Works, Chicago, Ill.

Filed Mar. 28, 1969, Ser. No. 811,342
Int. Cl. H01r 11/08
U.S. Cl. 339—256 R 8 Claims



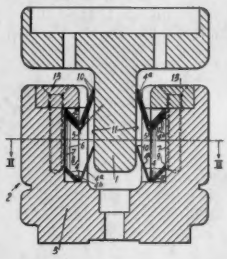
A connector receptacle for establishing a strong mechanical connection and a reliable low resistance electrical connection with a metal wire such as the lead wire of a miniature lamp or other wire is formed from an elongated tubular member. Offset sections of the wall of the tube adjacent an open end provide obstructions to insertion of the wire forcing the wire to be deformed beyond its elastic limit as the wire is inserted into the tube. The tube inwardly

of the obstructions includes an unobstructed portion of substantial length so that a substantial length of the wire is successively deformed as the wire is inserted. In order to withdraw the wire from the tubular receptacle, the wire must once again be deformed and the elastic limit overcome. Consequently, the wire is securely held in place and a low resistance electrical connection is obtained due to firm engagement between the wire and portions of the tube wall including the obstructions.

3,614,717
ELECTRIC CONTACT DEVICES

Rintje Boersma, Harmelen, and Gijsbert W. Irik, Bilthoven, both of Netherlands, assignors to N. V. "COQ" - Utrecht

Filed Aug. 22, 1969, Ser. No. 852,254
Int. Cl. H01r *13/12*
U.S. Cl. 339—262 R **9 Claims**

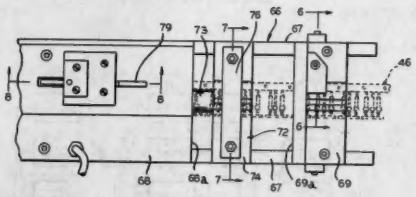


An electric contact device comprising two cooperating contacts, of which one consists of a holder containing at least one stack of interlocked, equal and equally directed, resilient, metal plates which are folded in V-shape and mounted for tilting about their folds in said holder, said plates lying with one of their free edges, which are parallel to the folds, against a contact surface of the holder and forming with their other free edges, which are also parallel to the folds, a resilient contact surface for cooperation with the other contact.

3,614,718
TERMINAL STRIP

Joseph J. Cervenka, 428 E. Crescent, Elmhurst, Ill., and Marvin E. Hetzel, 177 Michaux, Riverside, Ill.

Division of Ser. No. 709,109, Feb. 28, 1968, Pat. No. 3,550,250.
Filed Oct. 13, 1969, Ser. No. 865,570
Int. Cl. H01r *11/08*
U.S. Cl. 339—276 SF **5 Claims**



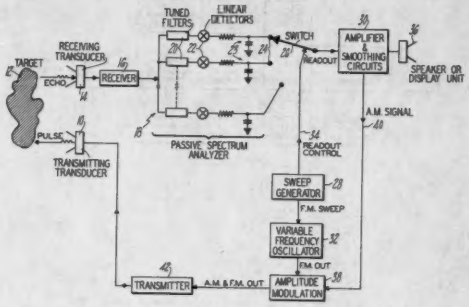
Continuous strip of terminal sets for use in a machine to mount the terminal sets on bobbins.

3,614,719
ADAPTIVE PULSE ECHO TARGET IDENTIFICATION SYSTEM

Edmond B. Treacy, Vernon, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed Nov. 25, 1968, Ser. No. 778,519
Int. Cl. G01s *9/66*
U.S. Cl. 340—3 R **7 Claims**

An adaptive target identification system is described in which a chirped or frequency swept pulse is transmitted towards a target. The reflected pulse is analyzed over its frequency spectrum by a series of tuned filters to produce a reflection spectrum which is proportional to the reflection coefficient of the target as a function of frequency. The next

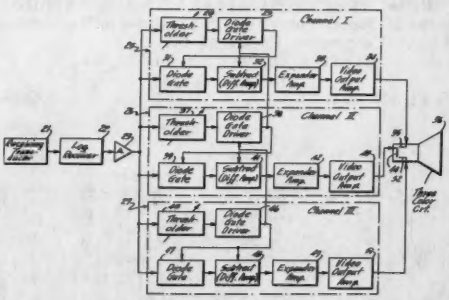


chirped pulse to be transmitted is modulated in response to the reflection spectrum, each pulse echo controlling the next transmitted pulse. A steady state condition results in which successive transmitted pulses are identical and uniquely determined by the reflection spectrum of the target.

3,614,720
LOGARITHMIC THREE-COLOR DISPLAY SONAR

Bobby R. Ludlum, Panama City, Fla., assignor to The United States of America as represented by the Secretary of the Navy

Filed Nov. 13, 1969, Ser. No. 876,510
Int. Cl. G01s *9/66*
U.S. Cl. 340—3 R **13 Claims**

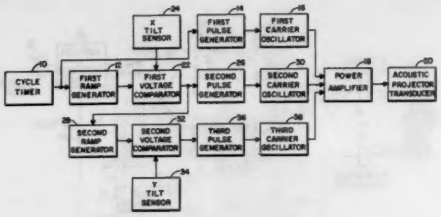


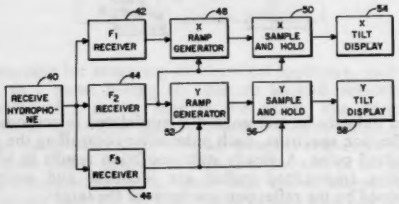
The instant invention is a sonar system which incorporates a receiving transducer and a receiver having logarithmic signal compression characteristics connected thereto. A trio of signal processing channels are connected to said receiver for respectively gating and passing the target echo signals received from targets whose echo level intensities fall within a trio of predetermined amplitude ranges, with the passed signals thereof being amplified by an amplifier having signal expansion characteristics that are substantially opposite to the logarithmic compression characteristics of the aforesaid receiver. After further amplification by a video amplifier, said signals are read out by a three-color cathode-ray tube, the colors of which respectively correspond to the aforesaid trio of predetermined echo level amplitude ranges.

3,614,721
CONTROL APPARATUS

James A. Lagoe, Woodenville, Wash., assignor to Honeywell Inc., Minneapolis, Minn.

Filed July 16, 1969, Ser. No. 842,239
Int. Cl. H04b 11/00
U.S. Cl. 340—5 R 9 Claims



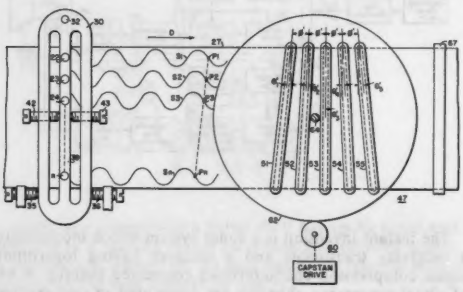


An acoustic riser angle indicator utilizing three separate frequencies for providing information, to a remote receiver, of deviation of a riser from vertical in mutually perpendicular vertical planes. The three separate frequencies are utilized to simplify reception circuitry and to eliminate multipath problems. The time interval between the first and second pulses of different frequencies indicates the deviation from vertical in one of the planes while the time interval between the second and third pulses indicates the deviation from vertical in the quadrature plane.

3,614,722
SIGNAL-PROCESSING APPARATUS AND METHOD

Charles H. Jones, Murrysville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 27, 1965, Ser. No. 505,444
Int. Cl. G01s 3/00
U.S. Cl. 340—6 R 9 Claims

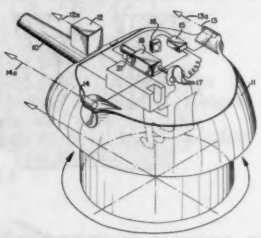


A plurality of recording heads records, on a magnetic medium, the signals derived from a corresponding plurality of transducers arranged in an array. Each recording head records a respective transducer signal on a separate track of the recording medium which is movable relative to the recording heads and relative to a readout means. The readout means comprises a plurality of linear transducers each of which extends across all of the recording tracks. The orientation of each linear transducer is greater than 0° with respect to movement of the recording medium and each linear transducer is at an angle with respect to one another. The signal provided by each linear transducer accordingly represents energy impinging upon the transducer array from a specified direction dependent upon the orientation of the linear transducer means. A scanning function is simulated by a rotation of the linear transducer means.

3,614,723
AIMING ARRANGEMENT

Heinz Hermes, Wedel; Helmut Hinterthur, Hamburg-Blankenese; Arnold Otto, Hamburg; Klaus Dietrich Thieme, Wedel, and Heinz Westhoff, Braunschweig, all of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt (Main), Germany

Filed Aug. 19, 1968, Ser. No. 788,354
Claims priority, application Germany, Aug. 19, 1967, L 57246 Ic/72f
Int. Cl. G01s 3/00
U.S. Cl. 340—16 R 6 Claims

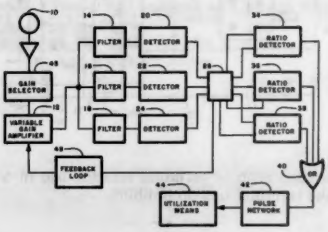


A gun turret of a tank, equipped with acoustic and optical aiming devices. The acoustic device is used to bring the gun to bear in the general direction of a target from which a noise comes, whereafter the optical aiming device, which may include an infrared searchlight, is turned on. In this way, the initial target acquisition and the preliminary aiming are done by passive means, the active aiming means being used only after the preliminary aiming and being needed for only a very short time.

3,614,724
DETECTION SYSTEM

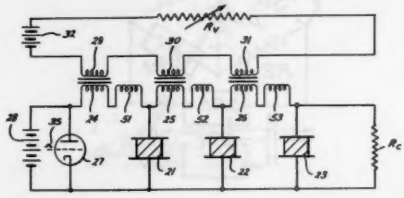
William L. Brown, and John M. Portlock, both of Albuquerque, N. Mex., assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed Apr. 8, 1970, Ser. No. 26,570
Int. Cl. G08b 13/00
U.S. Cl. 340—16 R 5 Claims



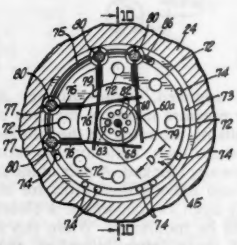
A detection system which utilizes an automatically varied threshold controlled by noise level in one or more frequency bands while monitoring a plurality of seismic frequency bands where signal and noise do not occur simultaneously. The signal and noise frequency bands may be preselected or they may be automatically determined during operation of the system.

3,614,725
CONTINUOUSLY VARIABLE STEERED BEAM TRANSDUCERS FOR ACOUSTIC WELL LOGGING
James H. Moran, Danbury, Conn., assignor to Schlumberger Technology Corporation, New York, N.Y.
Filed Apr. 18, 1969, Ser. No. 817,410
Int. Cl. G01v 1/16
U.S. Cl. 340—17 4 Claims



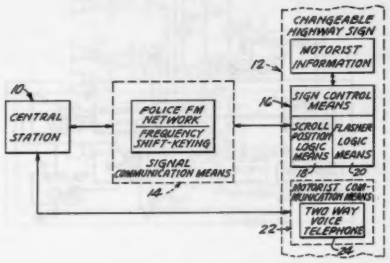
An illustrative embodiment of the present invention includes directional acoustic transducer apparatus for use in acoustic logging in a well bore for both transmitting and receiving acoustic logging signals. The apparatus utilizes a plurality of piezoelectric acoustic transducer elements and a plurality of inductors wound over permeable cores. The angle of directivity of the acoustic transducer may be remotely and continuously controlled by varying the magnetic bias of the permeable cores by means of a control circuit.

3,614,726
SLIPRING ASSEMBLY
Albert P. Richter, Jr., and James D. Bruner, both of Houston, Tex., assignors to Texaco Inc., New York, N.Y.
Continuation of application Ser. No. 682,485, Nov. 13, 1967. This application Oct. 30, 1969, Ser. No. 871,773
Int. Cl. H01r 39/08; G01v 1/40
U.S. Cl. 340—18 LD 3 Claims



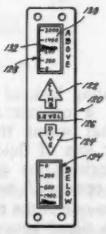
A slipring assembly including male and female portions wherein said portions are comprised of a stack of dielectric wafers and dielectric annular waferlike members, respectively. The stack of wafers, or discs, forming the male portion of the assembly is provided with a plurality of spaced-apart conductive sliprings. Registered apertures in the wafers provide wiring passages, or conduits, for electrical wires which are electrically bonded to the various conductive rings on the male portion. Each annular waferlike member comprising the female portion, which concentrically encompasses the male portion, carries four gold alloy contact wires, or brushes, which contact the conductive ring on one of the wafers comprising the male portion. The four wires are placed so that four points of contact with the slipring are spaced approximately 90° apart.

3,614,727
CHANGEABLE HIGHWAY SIGN AND MOTORIST AID SYSTEM
Robert W. Fritts, Afton Township, Washington County, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.
Filed Aug. 16, 1968, Ser. No. 753,096
Int. Cl. G08g 1/09
U.S. Cl. 340—22 8 Claims



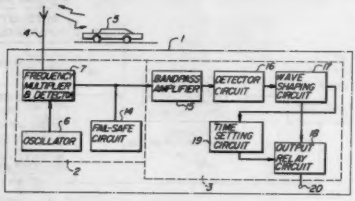
A changeable sign is disclosed which is adapted for use as a changeable highway sign located along a highway and which is capable of visually displaying to a motorist travelling in a vehicle along the highway any one of several predetermined driving messages. Additionally, a changeable highway sign system which incorporates a changeable highway sign is disclosed wherein the system includes a remotely located central station for selectively controlling changeable highway signs to continually inform the motorists of current speed limits, driving conditions and the like associated with the particular portion of the highway over which the motorists is traversing. The changeable highway sign and system, as disclosed herein, are adapted to include a motorist voice communication system to permit a motorist to communicate with a dispatcher at a central station.

3,614,728
INDICATOR MEANS FOR COLLISION AVOIDANCE SYSTEMS
Martin J. Borrok, Berkeley; Robert E. Perkinson, St. Louis County; Fred D. Watson, St. Louis County, and Wilbur H. Von Fange, Kirkwood, all of Mo., assignors to McDonnell Douglas Corporation, St. Louis, Mo.
Filed Mar. 6, 1970, Ser. No. 17,256
Int. Cl. G08g 5/04
U.S. Cl. 340—23 18 Claims



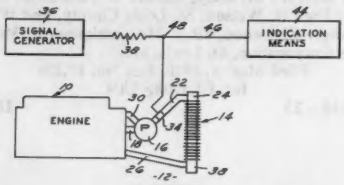
A single control panel indicator for aircraft cockpits combining collision avoidance warning means to indicate what command maneuver should be made to avoid being on a collision course with means for indicating rate of climb and maximum permissible rate of climb information from which the pilot will be advised as to how fast he can safely change his altitude during an escape maneuver and at other times and still remain on a safe course.

3,614,729
VEHICLE-DETECTING APPARATUS USING ELECTROMAGNETIC WAVE
Kyohei Fujimoto, Yokohama, and Nobuyuki Suyama, Chigasaki-shi, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Mar. 24, 1969, Ser. No. 809,843
Claims priority, application Japan, Mar. 29, 1968, 43/21134
Int. Cl. G08g 1/015, 1/06
U.S. Cl. 340—38 R 7 Claims



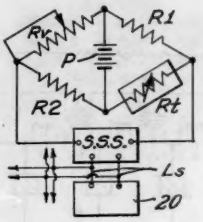
An all solid-state microwave vehicle-detecting apparatus specially equipped with time-setting circuits to attain a high accuracy in registering the number of moving vehicles on a roadway, said time-setting circuits processing signals to obtain an output well correlated with an actual number of vehicles regardless of the state of traffic, said vehicle-detecting apparatus having a high reliability and compactness attained by completely transistorized circuits and radiofrequency circuits of special design comprising a circuit which functions as a frequency multiplier as well as a signal detector.

3,614,730
ENGINE COOLANT LEVEL WARNING SYSTEM
Michael Bozoian, Ann Arbor, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed June 25, 1970, Ser. No. 49,691
Int. Cl. B60q 1/00
U.S. Cl. 340—59 9 Claims



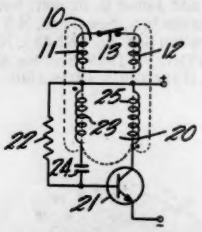
A system for indicating lack of or severe reduction of coolant flow through a coolant system for an internal combustion engine that warns the vehicle operator of catastrophic failure or loss of fluid in the engine cooling system, as well as apprising the operator that the engine coolant thermostat has opened. A metal band, for example, a hose clamp, is placed on one of the radiator hoses, preferably the upper hose, and a signal generator generating a high-frequency electrical signal is coupled to this metal band. An indication means in the form of a lamp driver circuit and a warning lamp is also connected to the metal band. When coolant is flowing through the radiator hose, the capacitance between the metal band and the engine is at a predetermined level, but when flow of coolant through the hose is reduced substantially, the capacitance is reduced substantially. This change of capacitance is sensed by the lamp driver circuit and will cause the warning lamp coupled to the lamp driver circuit to become illuminated when coolant flow through the radiator hose is at a low or nonexistent level.

3,614,731
TRANSPORT VEHICLE AXLE BEARING ALARM
Stephen A. Hluchan, Riverside; Sidney Herman, Covina, and Eugene G. Dowd, Rolling Hills, all of Calif., assignors to Bourns, Inc.
Filed June 15, 1970, Ser. No. 46,358
Int. Cl. B60q 5/00
U.S. Cl. 340—57 5 Claims



A system for producing an alert or alarm apprising the operator of a transport vehicle of the overheating of an axle bearing.

3,614,732
TRANSMISSION OF INFORMATION BETWEEN ELEMENTS IN RELATIVE MOTION
Daniel Lejeune, Clermont-Ferrand, France, assignor to Compagnie Generale des Etablissements Michelin, raison sociale Michelin & Cie, France
Filed June 18, 1969, Ser. No. 834,353
Claims priority, application France, June 21, 1968, 156203
Int. Cl. B60c 23/02
U.S. Cl. 340—58 10 Claims

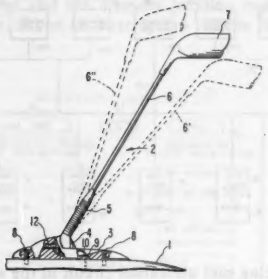


A driver is apprised, while driving, of an abnormal temperature or pressure in any of the tires of an automobile A receiver oscillator, mounted on the automobile frame near each tire, contains two inductors so arranged that the oscillator is normally blocked. A pair of inductors, associated with each tire and moving therewith, are arranged in series with a normally open switch, which is closed in response to the condition to be monitored. When this switch is closed, the passing of these latter inductors near those of the receiver oscillator causes it to become unblocked, thus producing a signal to warn the driver of the abnormal condition.

3,614,733
ELEVATED AUTOMOBILE BRAKE LIGHT ON SPRING MOUNT
Dewey D. Halligan, 239 Elk St., Santa Cruz, Calif.
Filed Mar. 31, 1970, Ser. No. 24,228
Int. Cl. B60q 1/00, 3/00
U.S. Cl. 340—87 4 Claims

A high-level stop and signal light has a mounting base which can be mounted on a vehicle's exterior surface such as the roof, rear pillar or rear deck of an automobile. The base holds a ball swivel that is locked in place by a screw, the swivel holding a lamp disposed in the end and shielded from sunlight by an extended hood. The lamp is connected to the

automobile brake light system or turn signal system. Upon rapid deceleration of the vehicle the flexible spring section



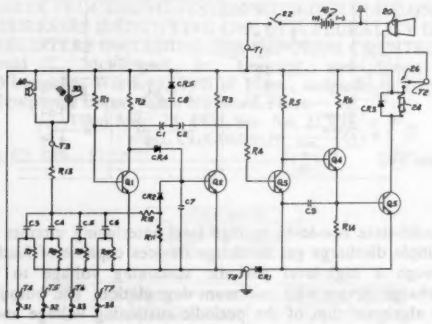
permits the lamp to rise to a more vertical position thus attracting the attention of other motorists.

3,614,734

AUTO ALARM SYSTEM

Charles E. Davis, 4608 Gilbert Ave., Dallas, Tex.

Filed June 17, 1968, Ser. No. 737,513
Int. Cl. B60r *25/00*; G08b *13/00*
U.S. Cl. 340—64 14 Claims



An automobile alarm system having a monostable multivibrator, an external trigger circuit and a driving circuit to actuate a relay to sound an an alarm when an abrupt increase in current drawn from automobile battery causes a temporary voltage change. The alarm is automatically deenergized after a predetermined period of time to prevent excessive drain of power from the battery.

3,614,735

MONITORING CIRCUITS

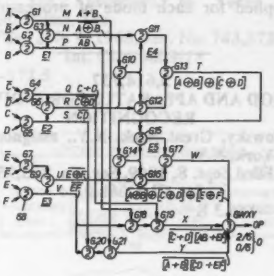
Roy Harold Mauger, and John Michael Frampton, both of Liverpool, England, assignors to The Plessey Company Limited, Ilford, England

Filed Oct. 16, 1969, Ser. No. 866,837
Claims priority, application Great Britain, Oct. 21, 1968, 49832/68
Int. Cl. G06f *11/00*
U.S. Cl. 340—146.1 4 Claims

The preferred circuit uses NAND gates or NOR gates in integrated circuit form and is employed for monitoring the "set" and "reset" sides of six storage toggles A to F to determine the validity or otherwise of their coded outputs. The circuit comprises three branches appropriate to the terms:

$(A \oplus B) \oplus (C \oplus D) \oplus (E \oplus F)$ 1/6, 3/6, 5/6

$(C+D)(AB+EF)$ .....
$(A+B)(CD+EF)$ ..... } 3 of 4/6



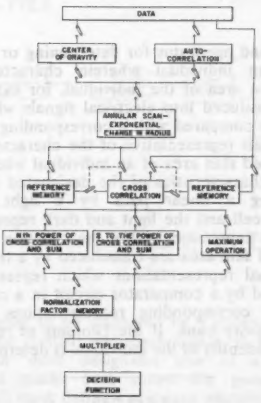
These branches are arranged to ensure that the only valid conditions are 2-out-of-6 and the null condition 0-out-of-6.

3,614,736

PATTERN RECOGNITION APPARATUS AND METHODS INVARIANT TO TRANSLATION, SCALE CHANGE AND ROTATION

John A. McLaughlin, San Jose, Calif., and Josef Raviv, Ossining, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

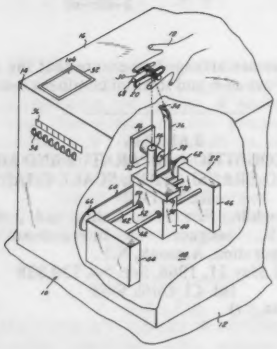
Filed May 21, 1968, Ser. No. 730,828
Int. Cl. G06k *9/08*
U.S. Cl. 340—146.3 Q 8 Claims



A pattern recognition system is disclosed which will recognize patterns irrespective of their translation rotation or scale change. Input data may be provided by a scanner or other suitable data source. Means for calculating the center of gravity, or alternatively the autocorrelation function are provided which can be employed; and then the data can be transformed for an actual or simulated annular or equivalently radial scan, with exponential spacing along radii. Alternatively, a straightforward raster scan may be employed for recognition which is invarient to translation only. The output is then processed in means for cross correlating with known patterns. The result is preferably raised to the Nth power and summed. Alternatively, 2 can be raised to the power of the cross correlation times K and summed which is easily done on a digital computer, or finally the result can be

subjected to maximum operation. In all cases, the pattern is then processed through corresponding means for normalization including a storage device, a multiplier and a decision function unit. Prior to operation for pattern recognition, the system is operated with the normalization storage connected through an inverter to the output of one of the Nth power, power of 2 or maximum operation units for receiving the appropriately processed data relative to a sample for normalization. Then the appropriate normalization may be supplied for each mode of processing after cross correlation.

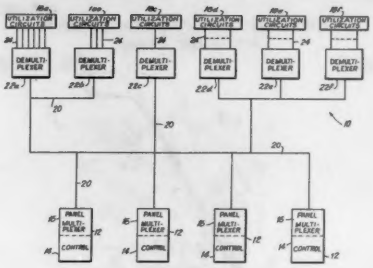
3,614,737
METHOD AND APPARATUS FOR INDIVIDUAL RECOGNITION
Charles Sadowsky, Great Neck, N.Y., assignor to Dactylog, Inc., New York, N.Y.
Filed Sept. 8, 1969, Ser. No. 855,955
Int. Cl. G06k 9/04
U.S. Cl. 340—146.3 E **10 Claims**



A method and apparatus for determining or verifying the identity of an individual wherein characteristics of a designated skin area of the individual, for example on the hand, are transduced into electrical signals which are then matched to or compared with a corresponding set of stored electrical signals representative of the characteristics of the same designated skin area of an individual whose identity is known. The characteristics of the designated skin area are scanned along a linear path by a light source and photoelectric cell and the light and dark representations of the ridges and depressions and/or the variation in contrast of the designated skin area are transduced by a transducer into electrical signal representations which representations are then compared by a comparator circuit in a computer with the allegedly corresponding representations stored in a computer memory bank. If the two sets of representations correlate, the identity of the individual is determined.

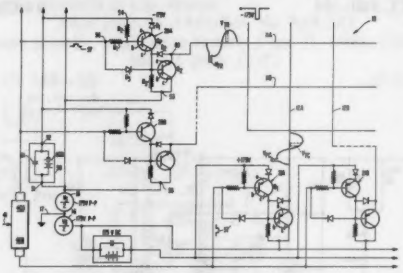
3,614,738
ATTENDANT CONTROL PANEL SYSTEM
Martin J. Slavin, Dix Hills, Huntington, N.Y., assignor to Phonplex Corporation, Huntington, N.Y.
Filed June 30, 1969, Ser. No. 837,828
Int. Cl. H04q 9/14
U.S. Cl. 340—163 **16 Claims**

A panel system whereby an attendant may control a plurality of utilization circuits including a control panel manually adjustable to a plurality of modes each representative of a particular utilization circuit to be controlled and the desired status thereof. The control panel is connected to a multiplexer for producing a multiplexed signal including in assigned time frames digital codes representative of said control panel mode. A plurality of demultiplexing means are each connected with at least a portion of said utilization circuits and said multiplexing means for receiving said multiplexed signal, and upon detecting a digital code assigned to one of its utilization



circuits, placing said utilization circuit in the status indicated by said control panel.

3,614,739
INTEGRATED DRIVING CIRCUITRY FOR GAS DISCHARGE PANEL
William E. Johnson, Toledo, Ohio, assignor to Owens-Illinois, Inc.
Filed May 2, 1969, Ser. No. 821,306
Int. Cl. H01j 17/38; H05b 37/00
U.S. Cl. 340—166 R **18 Claims**

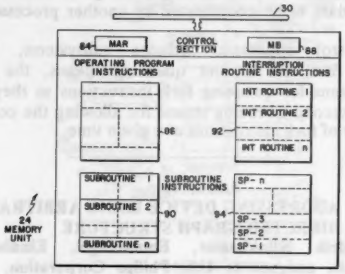


Solid-state low-level to high-level interfacing circuits for multiple discharge gas discharge devices capable of feeding through a high-level periodic sustaining voltage to the discharge device with minimum degradation. The output is the algebraic sum of the periodic sustaining voltage and a level converted logic signal. NPN circuits are used to drive one set of conductors in an array and PNP circuits are used for driving transversely related conductor arrays in the gas discharge device. Dielectric isolation in the fabrication of the integrated circuits is utilized and the circuits are such as to not require any inductance or capacitance elements, thus reducing cost and size of the circuits. The circuit appears as a low impedance to the load. There is no mixing of active elements (NPN vs PNP) in a circuit wafer or chip. Consult the specification for features and details.

3,614,740
DATA PROCESSING SYSTEM WITH CIRCUITS FOR TRANSFERRING BETWEEN OPERATING ROUTINES, INTERRUPTION ROUTINES AND SUBROUTINES
Bruce A. Delagi, Acton; Harold L. McFarland, Jr., Concord, and James F. O'Loughlin, Westford, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.
Filed Mar. 23, 1970, Ser. No. 021,957
Int. Cl. G06f 9/12
U.S. Cl. 340—172.5 **33 Claims**

A data processing system processor unit for executing instructions from one of a plurality of partially completed

operating routines. With each subroutine transfer a first register provides memory location address for storing a second register contents. The program count is stored in the second register; and the first subroutine instruction address is transferred to the program counter. A last subroutine instruction moves the second register contents to the program counter and the memory location contents to the second register. When an interruption routine is started, the



contents of the program counter and a status register are transferred directly into a pair of memory locations defined by addresses from the first register. A last interruption routine instruction moves the contents of the two memory locations defined by addresses from the first register to the processor unit. The last operating routine to be started is always the first one to be completed so that any number of routines may be partially completed.

3,614,741

DATA PROCESSING SYSTEM WITH INSTRUCTION ADDRESSES IDENTIFYING ONE OF A PLURALITY OF REGISTERS INCLUDING THE PROGRAM COUNTER

Harold L. McFarland, Jr., Concord, and James F. O'Loughlin, Westford, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Mar. 23, 1970, Ser. No. 21,973
Int. Cl. G06f *9/20*
U.S. Cl. 340—172.5 **24 Claims**

OPERAND ADDRESS					
5	4	3	2	1	0
ADDRESS MODE			REGISTER SELECTION		

ADDRESS MODE	ADDRESS MODE BITS 5	4	3	DEFINITION
0	0	0	0	REGISTER-DIRECT
1	0	0	1	REGISTER DEFERRED
2	0	1	0	AUTO-INC DIRECT
3	0	1	1	AUTO-INC DEFERRED
4	1	0	0	AUTO-DEC DIRECT
5	1	0	1	AUTO-DEC DEFERRED
6	1	1	0	INDEX DIRECT
7	1	1	1	INDEX DEFERRED

REGISTER SELECTION BITS 2	1	0	SELECTED REGISTER
0	0	0	R0
0	0	1	R1
0	1	0	R2
0	1	1	R3
1	0	0	R4
1	0	1	R5
1	1	0	R6
1	1	1	R7

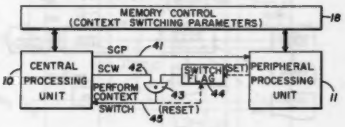
A data processing system processor unit including memory addressing circuits. Operand addresses for identifying data storage locations comprise operand address mode and register selection bits. One of a plurality of registers in the processor unit, which includes the program counter, is selected by decoding the register selection bits. The selected register contents are transferred to the processor unit as data, data addresses or addresses of intermediate storage locations containing data addresses to provide direct, indirect or double deferred addressing. Data or data addresses interleaved with or obtained from information interleaved with instructions are obtained by selecting the program counter. This provides immediate, absolute, relative and deferred relative addressing. The selected register contents are modified if certain address modes are used. A given operation code can be combined with one or two operand addresses in order that each instruction can obtain data from locations in the most efficient manner.

3,614,742

AUTOMATIC CONTEXT SWITCHING IN A MULTIPROGRAMMED MULTIPROCESSOR SYSTEM

William J. Watson, and William D. Kastner, both of Richardson, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed July 9, 1968, Ser. No. 743,572
Int. Cl. G06f *9/18*
U.S. Cl. 340—172.5 **9 Claims**



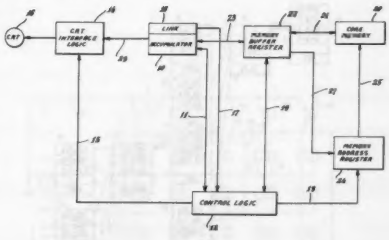
An interface between a central processing unit and a peripheral processing unit responds to a program instruction of either system call and proceed or system call and wait. Interfacing interlocking is provided for directing to a reserved address in memory an instruction code developed in the central processing unit which is responsive to the instruction to reduce overhead time in switching programs and in directing the peripheral processing unit in its support of the central processing unit.

3,614,743

VARIABLE STROKE CHARACTER GENERATOR

Murray Ruben, Belmont, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Jan. 14, 1969, Ser. No. 791,121
Int. Cl. G06f *3/14*; G06k *15/18, 15/20*
U.S. Cl. 340—172.5 **17 Claims**



Each character to be displayed by a cathode-ray tube is assigned unique control and mask words. A portion of the assigned mask word designates one of a plurality of predetermined masks best suited for generation of a character; each mask defining a unique plurality of character stroke endpoints. The control word determines which of the various character strokes defined by a mask are to be executed by the CRT beam, while the remaining portion of the mask word determines which of the executed character strokes are to be visible.

3,614,744

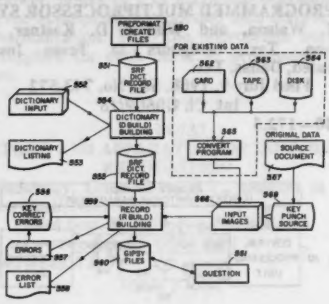
GENERALIZED INFORMATION PROCESSING

James W. Sweeney, Norman, Okla., assignor to The University of Oklahoma Research Institute

Filed June 27, 1969, Ser. No. 837,237
Int. Cl. G06f *15/40*
U.S. Cl. 340—172.5 **11 Claims**

Strings of variable content natural language alphanumeric data are stored in computer memory at addressable locations along with an internal format code and a relative address.

The data is serially compared with stored variables which produce truth responses through the internal format code. The number of responses per variable is stored. The addresses of data for each said truth response satisfying a predetermined logical combination of said variables are



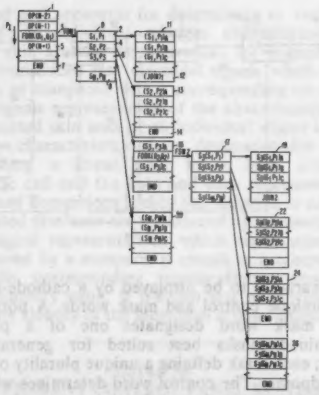
stored. Thereafter, data at the stored addresses are serially compared through the internal format code with at least one additional variable. The truth responses of said additional variable render accessible in storage the addresses of the corresponding data for each such truth response.

3,614,745

APPARATUS AND METHOD IN A MULTIPLE OPERAND STREAM COMPUTING SYSTEM FOR IDENTIFYING THE SPECIFICATION OF MULTITASKS SITUATIONS AND CONTROLLING THE EXECUTION THEREOF

Albert Podvin, Woodland Hills, Calif., and Michael J. Flynn, Evanston, Ill., assignors to International Business Machines, Armonk, N.Y.

Filed Sept. 15, 1969, Ser. No. 858,022
Int. Cl. G06f *15/16*
U.S. Cl. 340—172.5 **3 Claims**



A system is described, useful in a multiple operand stream, or parallel, data processing system, for detecting the specification of independent tasks which can be operated upon in parallel. The specification of the independent parallel operable tasks is given by a fork instruction specifying the number of tasks and the physical or logical function to be performed for the task. A fork point can therefore be visualized as a logical node point where a given class of physical or logical tasks is undertaken. There is control apparatus associated with each node point. The control apparatus is a resource distributor-manager and also a controller into which each system resource reports when it has become free from whatever other task it was performing. The control apparatus dynamically allocates resources to the tasks in the fork on an as-available basis. The fork ends at a join point where data from the parallel tasks is coordinated. In one embodiment, the processor which initiated the fork may reach the join point, and apparatus is provided which gives this processor the options to wait for all tasks to be completed and coordinate data itself; to become one of the fork processors and help out by taking on an undistributed task, if one or more tasks remain undistributed; or to abort, for example under priority interrupt, and go to another job leaving the data to be coordinated by another processor in the system.

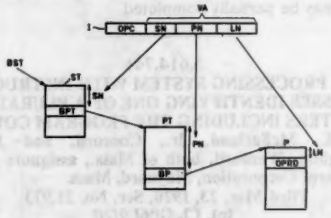
The control apparatus includes subsystems, each comprising first and second queueing means, the first queueing means for queueing fork instructions as they are issued, and second queueing means for allowing the control of a plurality of fork instructions at a given time.

3,614,746

MEMORY ADDRESSING DEVICE USING ARBITRARY DIRECTED GRAPH STRUCTURE

Jacob Fredrik Klinkhamer, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 22, 1969, Ser. No. 868,299
Claims priority, application Netherlands, Oct. 31, 1968, 6815506
Int. Cl. G06f *9/10, 9/20*
U.S. Cl. 340—172.5 **7 Claims**



Data-processing system comprising an addressing device for addressing in a directed graph structure in a store which is divided for this purpose into tables each having a reference address as a table base. Relative to the table base, the words to be found numerically in the table are reference addresses for a further table or operands or indirect addresses for operands. In order to permit highly flexible addressing in a directed graph structure, the address portion of an instruction and/or any sequential words contains an arbitrary number of address components which may have different lengths. The table words may have table length data of a further table to permit a length check and addressing in overflow tables.

3,614,747

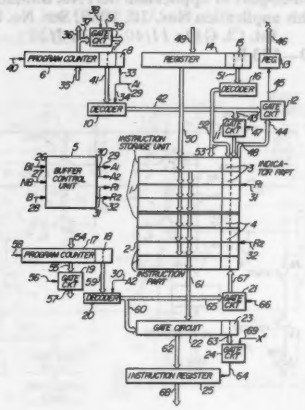
INSTRUCTION BUFFER SYSTEM

Koichiro Ishihara, and Tetsunori Nishimoto, both of Hatanoshi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 29, 1969, Ser. No. 872,065
Claims priority, application Japan, Oct. 31, 1968, 43/79553
Int. Cl. G06f *9/00*
U.S. Cl. 340—172.5 **13 Claims**

An instruction buffer for electronic computer systems, mainly comprising a pair of groups of registers in which instructions read out from the memory unit are stored and a control unit for controlling the selection of said groups of registers, normally one group of registers being used and the second group being used when a conditional branch instruction occurs in the program, so as to store the instructions in the branch program, the subsequent use of the

groups of registers depending on the fate of the branch condition, thereby the advanced control of readout being possible throughout the program, ensuring a high-speed operation.

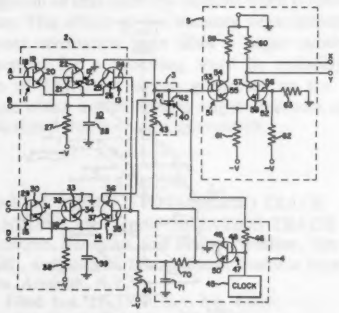


3,614,748

HIGH-SPEED MEMORY AND MULTIPLE LEVEL LOGIC NETWORK WITH PULSE SHAPING

William Peil, North Syracuse, and Richard J. Pepe, Liverpool, both of N.Y., assignors to General Electric Company

Filed Jan. 7, 1970, Ser. No. 1,115
Int. Cl. G11c *11/36*
U.S. Cl. 340—173 R **5 Claims**



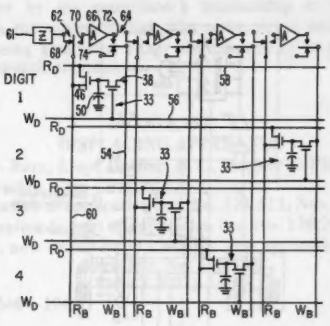
To substantially improve the operation of a high-speed, low-power digital logic network of the type including a bistable tunnel diode circuit, a source of clock signal pulses and a multiple input logic gate circuit for generating logic signal pulses in response to applied binary inputs and said clock signal pulses, said logic and clock signal pulses being coupled to said tunnel diode circuit for driving it into a first stable state when concurrently applied and into a second stable state with said clock signal pulses solely applied, the improvement comprising the employment of pulse-shaping circuit at the output of the clock signal source for shaping the clock signal pulses applied to said logic gate circuit so as to relax component tolerances and reduce spurious operation.

3,614,749

INFORMATION STORAGE DEVICE

Arthur J. Radcliffe, Jr., Plymouth, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Filed June 2, 1969, Ser. No. 829,426
Int. Cl. G11c *11/24, 11/40*
U.S. Cl. 340—173 R **5 Claims**



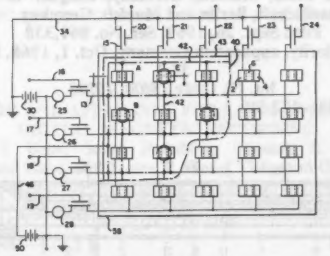
An information storage device comprising a capacitive memory cell utilizing a pair of insulated gate field-effect transistors controlling the "read" and the "write" operations of the cell. A capacitor is electrically connected to both transistors to function as the information storage element of the cell. The capacitor may be either a discrete component or it may be formed on the same substrate as are the two transistors.

3,614,750

READ-ONLY MEMORY CIRCUIT

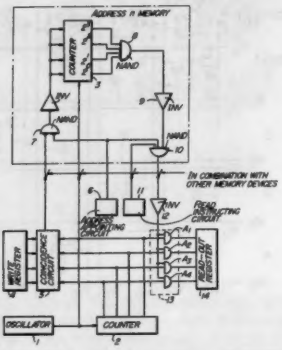
John L. Janning, Dayton, Ohio, assignor to The National Cash Register Company, Dayton, Ohio

Filed July 15, 1969, Ser. No. 841,760
Int. Cl. G11c *17/00*
U.S. Cl. 340—173 SP **4 Claims**



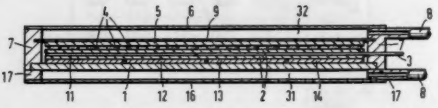
The present invention relates to a read-only memory card comprising a coded array of dielectric coated gate electrodes mounted on a nonconductive substrate. The invention also relates to a read-only memory card reader for reading said read-only memory card comprising source electrode-semiconductor material-drain electrode elements on a nonconductive substrate. Field-effect transistors are formed when the read-only memory card is placed on the read-only memory card reader. The field-effect transistors are probed by applying a gate voltage to the coded array of dielectric coated gate electrodes of the read-only memory card and applying a source-drain voltage to each element of the read-only memory card reader. The field-effect transistors, only, will conduct a source-drain current. A source-drain current, which passes through the completed field-effect transistors, is sensed, in order to read the information in the read-only memory card.

3,614,751
MEMORY CIRCUIT
Hiroshi Narisawa, Yokohama, Japan, assignor to Hitachi, Ltd., Tokyo, Japan
Filed Sept. 18, 1969, Ser. No. 858,987
Claims priority, application Japan, Sept. 20, 1968, 43/67603
Int. Cl. G11c 13/00
U.S. Cl. 340—173 R 8 Claims



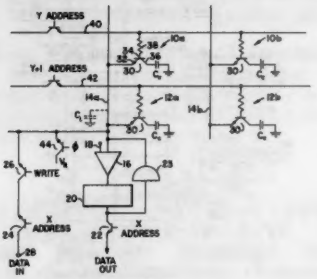
A memory circuit comprising counters of which the number of bits is equal to that of information, each one of the said counters corresponding to each address, and a single such counter common to all the addresses, wherein the said counters are advanced in synchronism with clock pulses, the counter corresponding to the address where information is to be written is set to a particular numerical representation at such a clock position that the contents of the write register and common counter are in conformity with each other, and the content of the common counter is read out at such a clock position that the address counters represent a particular number and is then transferred to a read-out register.

3,614,752
STORAGE ARRANGEMENT WITH CONTACT PRESSURE DEVICE
Karl-Ulrich Stein, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany
Filed Sept. 26, 1969, Ser. No. 861,338
Claims priority, application Germany, Oct. 1, 1968, P 18 00 34.3
Int. Cl. G11c 13/00, 19/00
U.S. Cl. 340—173 SP 3 Claims



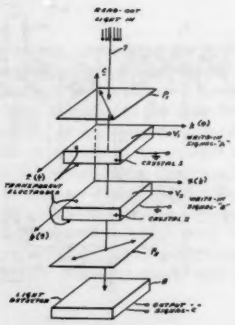
An electrical, relatively flat and comparatively thin storage arrangement in which the components are disposed in relatively flat stacked relation one upon the other, having means forming a generally correspondingly shaped chamber in which the stack of components is disposed, the chamber having a wall thereof, bearing on one of the outermost components of the stack, constructed to transmit pressure applied to the external face thereof to said stack whereby the components of the latter may be placed under compression by action of substantially equal pressure forces acting on said wall and the opposite parallel wall of said chamber in opposite directions substantially perpendicular to said first-mentioned wall, means being provided for effecting the application of such pressure with atmospheric or a greater pressure being employed as the pressure-effecting medium.

3,614,753
SINGLE-RAIL SOLID-STATE MEMORY WITH CAPACITIVE STORAGE
Sven E. Wahlstrom, Palo Alto, Calif., assignor to Shell Oil Company, New York, N.Y.
Continuation-in-part of application Ser. No. 825,257, May 16, 1969. This application Nov. 10, 1969, Ser. No. 875,240
Int. Cl. G11c 11/40; H03k 3/26
U.S. Cl. 340—173 R 3 Claims



A one-device-per-bit random-access memory array is constructed with integrated-circuit transistors as the memory cell switching elements. The transistors used are bidirectionally conductive and have a beta of at least two in both directions. Information transfer is accomplished by transferring incremental charges between the collector-to-substrate capacitance of the transistor and the bit line capacitance.

3,614,754
FERROELECTRIC GADOLINIUM MOLYBDATE COMPENSATION TYPE BISTABLE LIGHT GATE AND LOGIC CELL HAVING MEMORY
Stewart E. Cummins, 11810 Stafford Road, New Carlisle, Ohio
Filed Mar. 17, 1969, Ser. No. 807,753
Int. Cl. G02f 1/26; G11c 11/22, 13/04
U.S. Cl. 340—173.2 6 Claims

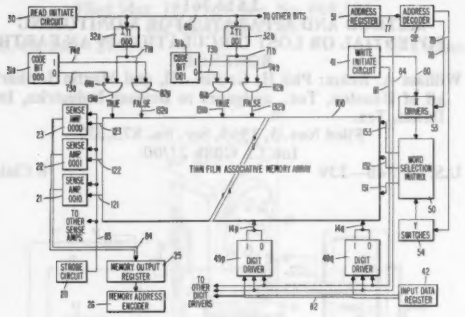


Two, electroded, birefringent, bistable crystals of ferroelectric gadolinium molybdate are aligned along their crystallographic *c* axis between crossed optical polarizers. When the two crystals have their respective spontaneous polarization switched by an electrical pulse so that the directions of their *a* and *b* axes respectively coincide, the retardations add, and when they are switched so that the *a* direction of one crystal aligns with the *b* direction of the other crystal the retardations subtract. In the former instance light is passed, in the latter no light is transmitted through the crystals and crossed polarizers. Each bistable ferroelectric gadolinium molybdate crystal has memory in that only an electrical pulse is required to bring about a change of state which is retained until the crystal is conversely pulsed.

3,614,755
ASSOCIATIVE THIN FILM MEMORY ORGANIZATION

Joseph W. Hart, Phoenixville, Pa., assignor to Burroughs Corporation, Detroit, Mich.

Filed Feb. 3, 1969, Ser. No. 796,087
Int. Cl. G11c *15/00, 11/14*
U.S. Cl. 340—174 GA 10 Claims

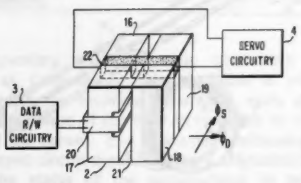


This disclosure relates to an associative memory organization of an array of thin film storage elements for the storing of bits and the complement bits corresponding thereto. Upon the presentation of a code word to the code word register, a ZERO residing in the significant bit level of the code word will cause the interrogation of a particular significant bit level in the memory array while the presence of a ONE in the code word will cause the interrogation of the corresponding complement bit level. In this manner, a match between the contents of a particular word location in the memory and the code word will result in the interrogation of only those memory elements which reside in a ZERO state in the matching word location. The disclosure also describes a manner of orienting the individual thin film storage elements to minimize the signal induced on the respective sense lines upon interrogation of that memory element when it resides in a ZERO state. The effect of the memory organization and storage element orientation is to allow a larger number of bits to be sensed for a matching word by reducing the accumulation of ZERO bit signals generated on the word level sense line which accumulations might otherwise cancel out a ONE bit signal that indicates a mismatch.

3,614,756
MAGNETIC RECORD WITH SERVO TRACK PERPENDICULAR TO INFORMATION TRACK

Robert P. McIntosh, Saratoga, and Marco Padalino, San Jose, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 21, 1970, Ser. No. 4,666
Int. Cl. G11b *5/28, 5/38, 21/08*
U.S. Cl. 340—174.1 C 9 Claims

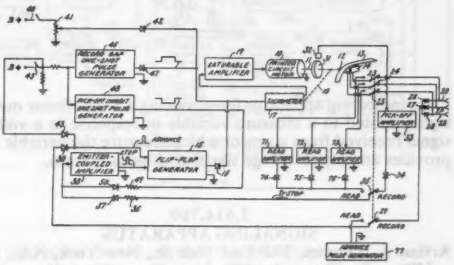


The invention relates to a servosystem used in a random access disk memory system which comprises a magnetic disk having servo tracks recorded such that the magnetic domains within the servo tracks are aligned radially from the center of the disk and data tracks which have the magnetic domains are aligned concentrically about the center of the disk, and a transducer capable of developing a data signal as a function of the rate of change of the magnetic flux associated with the data tracks and a servo signal generated by the magnitude of the absolute flux magnitude that it presented to the transducer by the transducer's relationship to the servo tracks on the magnetic disk, the servo signal and the data signals being generated either simultaneously or alternately in the magnetic transducer.

3,614,757
DISPLACING APPARATUS

Robert P. Burr, Lloyd Harbor, N.Y., assignor to Photocircuits Corporation, Glen Cove, N.Y.

Continuation of application Ser. No. 321,511, Nov. 5, 1963, Continuation-in-part of application Ser. No. 120,256, June 28, 1961, now Patent No. 3,182,243. This application Mar. 4, 1966, Ser. No. 536,541
Int. Cl. H02p *5/06*
U.S. Cl. 340—174.1 12 Claims

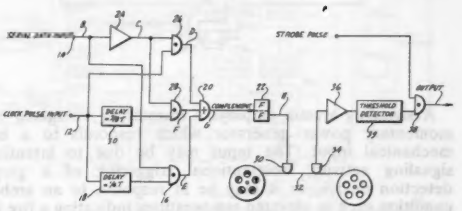


Apparatus for advancing magnetic tape with respect to a recording head through small, discrete, and uniform displacement increments. A direct current drive motor has an armature shaft that drives a displaceable member. Controls develop signals that energize and deenergize the motor. Included in these controls are a speed responsive tachometer and an acceleration control utilizing a saturable amplifier.

3,614,758
METHOD AND APPARATUS FOR SATURATION-TYPE DIGITAL MAGNETIC RECORDING

Michael I. Behr, South Pasadena; Norman S. Blessum, Thousand Oaks, and James T. Wang, Thousand Oaks, all of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed July 9, 1969, Ser. No. 840,394
Int. Cl. G11b *5/06*
U.S. Cl. 340—174.1 G 15 Claims



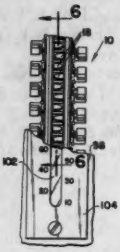
There is described a digital magnetic recording arrangement using saturation recording in which the intervals between successive data transitions from one saturation level to the other on the magnetic medium are varied according to

a predetermined code and in which one or more pairs of control transitions are inserted on the tape between adjacent data transitions, the number of pairs of control transitions being determined by the spacing between the adjacent data transitions.

3,614,759
INDICATING APPARATUS

Edward H. Moore, Avon, and Milton A. Aron, Newington, both of Conn., assignors to The Gems Company, Inc., Farmington, Conn.

Filed May 28, 1969, Ser. No. 828,563
Int. Cl. H02b 1/04, 9/00
U.S. Cl. 340—212 **10 Claims**

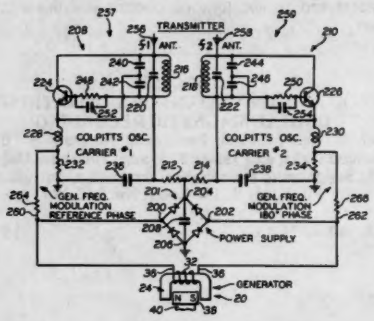


An indicating apparatus for providing a visual linear output signal related to a measure variable in response to a voltage signal received from a sensor which measure the variable and provides an output voltage signal analogous thereto.

3,614,760
SIGNALING APPARATUS

Arthur L. Zimmet, 203 East 76th St., New York, N.Y., and Milton P. Chernack, 299 June Place, West Hempstead, N.Y., assignors to Arthur L. Zimmer; Milton P. Chernak and Murray S. Trachtenberg, Bayside, N.Y., part interest to each

Filed Dec. 27, 1968, Ser. No. 787,456
Int. Cl. G08b 5/22
U.S. Cl. 340—224 **11 Claims**

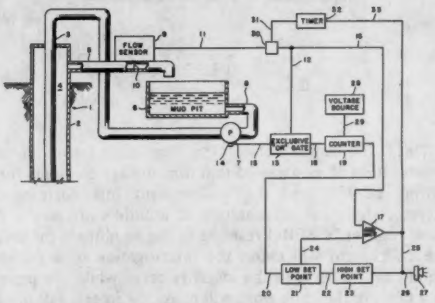


A signaling system employs a transmitter energized by a momentary power generator which responds to a brief mechanical input. The input may be due to intentional signaling activity, unintentional triggering of a gurglar detection device, or it may be in response to an ambient condition such as elevated temperatures indicating a fire is in progress. The mechanical event vibrates a spring-mass pendulum. The vibrating mass traverses an airgap in a magnetic circuit to induce an alternating potential in a signal output coil. The output of this generator is rectified to provide power for one or more radio frequency transmitters, and in addition may be used as the modulating signal impressed upon the radio frequency carrier. Two radio frequency transmitters operating at different carrier frequencies may be modulated by different phase components of the generator frequency. Alternatively, the modulation may be supplied by one or more subcarrier generators energized by the mechanical power generator. For greater noise immunity, a variation of this system may employ coded combinations of subcarrier frequencies.

3,614,761
METHOD AND APPARATUS FOR MONITORING POTENTIAL OR LOST CIRCULATION IN AN EARTH BOREHOLE

William A. Rehm; Phil H. Griffin, III, and Martin J. Sharki, all of Houston, Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Nov. 3, 1969, Ser. No. 873,337
Int. Cl. G08b 21/00
U.S. Cl. 340—239 **8 Claims**

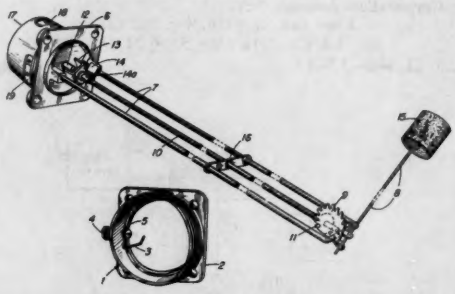


Method and apparatus for monitoring potential blowouts or lost circulation in a well by employing sensing devices on the drilling fluid pump and the well bore return pipe for the drilling fluid. Means are provided for monitoring the drilling fluid pumped into the well bore and for sounding a warning if a certain amount of drilling fluid flows out of the well bore before a minimum amount of drilling fluid is pumped into the well bore. Means are also provided for sounding the warning if no drilling fluid flows out of the well bore and the certain maximum amount of drilling fluid has been pumped into the well bore.

3,614,762
TANK RUNOUT WARNING SIGNAL

Elbert B. Childs, Hastings-on-Hudson, N.Y., assignor to Mobil Oil Corporation

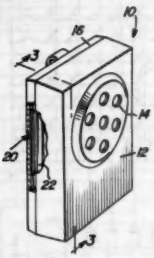
Filed Oct. 8, 1968, Ser. No. 765,842
Int. Cl. G08b 21/00
U.S. Cl. 340—244 B **12 Claims**



A liquid level indicator and alarm wherein a contact is secured to a movable element of a liquid level gauge, and a

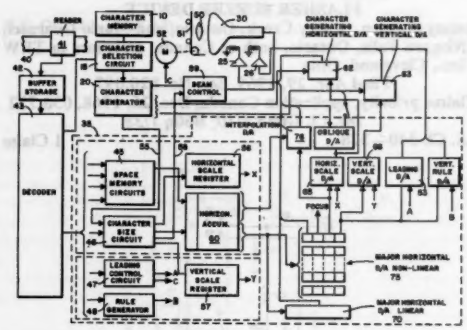
fixed contact is secured to the housing thereof. As the liquid level varies, the position of the movable element likewise varies and when the liquid reaches a predetermined level, the fixed and movable contact elements complete a circuit which triggers an alarm.

3,614,763
PRONE POSITION ALARM
Anthony Yannuzzi, 10 Birchwood Ave, West Orange, N.J.
Filed Mar. 18, 1969, Ser. No. 808,106
Int. Cl. G08b 21/00
U.S. Cl. 340—279 13 Claims



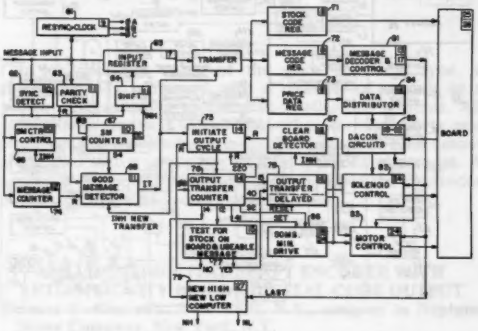
A housing to be secured to a person's clothing encloses an audio signal generator. A mercury switch is connected to the generator so that when the person falls to a prone position, the mercury switch energizes the circuit to cause issuance of an alarm signal. The housing further encloses medication and a medical record sheet which informs a first aider as to the person's medical condition.

3,614,764
APPARATUS FOR PROVIDING GRAPHICAL IMAGES ON A RADIANT-ENERGY-RESPONSIVE SURFACE
Edwin R. Kolb, University Heights, and Herbert E. Drake, Willowick, both of Ohio, assignors to Harris-Intertype Corporation, Cleveland, Ohio
Filed Mar. 4, 1968, Ser. No. 710,350
Int. Cl. G06f 3/14
U.S. Cl. 340—324 A 5 Claims



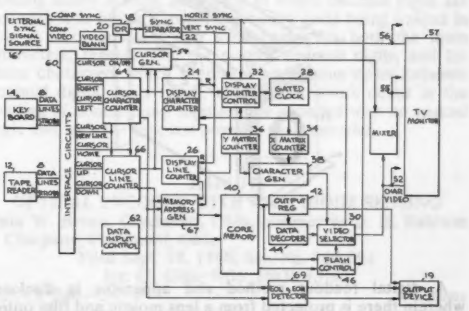
A phototypesetting system wherein characters may be displayed on a cathode-ray tube includes a character-positioning means for locating accurately each character horizontally on the face of the tube in response to the status of an accumulator means. The character-positioning means includes an output circuit means having a substantially linear response to the status of the accumulator to provide a substantial portion of the character-positioning signal, and a compensating means, also responsive to the status of the accumulator means, to supply only that portion of the character-positioning signal which is necessary to compensate for nonlinearity in the characteristics of the cathode-ray tube so that the characters of consistent size may be accurately positioned regardless of the horizontal position of the characters relative to the face of the tube.

3,614,765
QUOTATION BOARD SYSTEM
George H. Huber, Cinnaminson; Eugene I. Gertler, Cinnaminson; Habgood, Dennis W., Magnolia; John A. Ciarrocchi, Magnolia, and Walter A. Richman, Woodcrest, all of N.J., assignors to Ultronic Systems, Pennsauken, N.J.
Division of Ser. No. 542,057, Apr. 12, 1966, Pat. No. 3,416,134.
Filed July 2, 1968, Ser. No. 742,011
Int. Cl. G09f 11/08, 11/28
U.S. Cl. 340—324 3 Claims



A quotation board system for the display of prices of stocks, commodities and the like wherein messages are transferred from a central location to individual quotation board locations. Different stocks can be selected at each location for display using manually changeable stock identification characters and individual digit units for displaying prices.

3,614,766
DISPLAY DEVICE INCLUDING ROLL AND CRAWL CAPABILITIES
James M. Kievit, Des Plaines, Ill., assignor to A.B. Dick Company, Chicago, Ill.
Filed June 9, 1969, Ser. No. 831,687
Int. Cl. G06f 3/14
U.S. Cl. 340—324 A 27 Claims



Data display apparatus is provided with the capability for moving the lines of data vertically upward across the face of the display tube, or characters of data from right to left

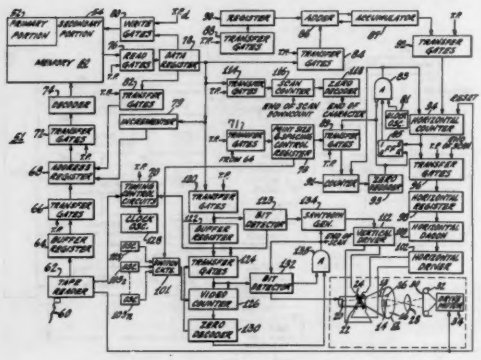
across the face of the display tube. Characters stored in a memory are read out by addressing the memory in synchronism with a TV display scan.

3,614,767

ELECTRONIC PHOTOCOMPOSING SYSTEM THAT FORMS CHARACTERS OF DIFFERENT POINT SIZES

Ross M. Carrell, Cinaminson, N.J., assignor to RCA Corporation

Filed Dec. 24, 1968, Ser. No. 786,672
Claims priority, application Great Britain, Feb. 19, 1968, 08078/68
Int. Cl. G06f 3/14
U.S. Cl. 340—324 A 5 Claims



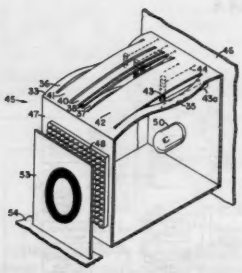
An electronic photocomposing system forms alphanumeric characters on the face of a cathode-ray tube by a plurality of vertical scanlines that form slices of the characters. The characters are imaged onto photographic film for subsequent processing into printing plates. Characters of different point sizes are formed by changing the lengths of the scanlines, as well as the spacing between adjacent scanlines.

3,614,768

DIGITAL READOUT METHOD AND APPARATUS

Iben Browning, 745 Distel Drive, Los Altos, Calif.

Filed May 1, 1968, Ser. No. 725,634
Int. Cl. G08b 5/32
U.S. Cl. 340—325 3 Claims



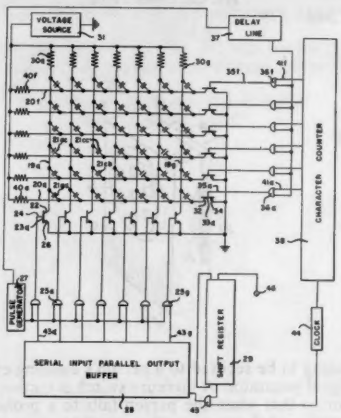
A digital readout method and apparatus is disclosed wherein there is projected from a lens mosaic and film onto a screen a decimal number equivalent to the binary number at the input of a binary coded decimal displacement transducer to which the lens mosaic or film is mechanically connected for displacement proportional to the decimal value of the binary number at the input of the transducer.

3,614,769

FULL SELECT-HALF SELECT PLASMA DISPLAY DRIVER CONTROL

William E. Coleman, Dayton, and Robert R. Skutt, Centerville, both of Ohio, assignors to The National Cash Register Company, Dayton, Ohio

Filed Aug. 4, 1969, Ser. No. 847,141
Int. Cl. G09f 9/30
U.S. Cl. 340—324 R 14 Claims



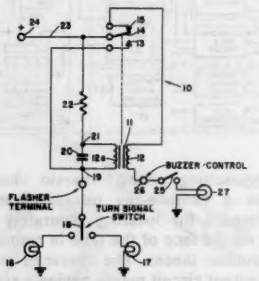
A driver circuit in the form of a matrix formed by segment and character electrodes is utilized in a visual display for the selection of specific electroluminescent cells containing an encapsulated gas. Cells are driven into ignition by alternating energizing segment and character electrodes connected to the selected cells. The driver circuit utilizes a wall charge deposited on the individual cell walls during ignition of the cell, in the selection process for igniting selected cells. The wall charge is also utilized in preventing unselected cells connected to the energized segment or character electrode from igniting after the initial energization of the selected segment electrode and selected character electrodes.

3,614,770

FLASHER BUZZER DEVICE

Rodney Hayden, Stoney Creek, Ontario, and Mario Guarasci, Niagara Falls, Ontario, both of Canada, assignors to TRW Inc., Cleveland, Ohio

Filed Apr. 29, 1969, Ser. No. 820,097
Claims priority, application Canada, Dec. 26, 1968, 038,722
Int. Cl. G08b 3/10; B60q 1/38
U.S. Cl. 340—328 1 Claim

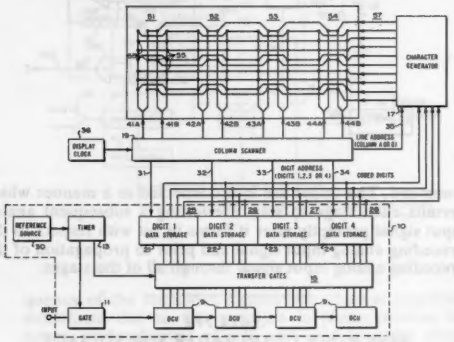


A combination flasher buzzer relay device having switch means operated by either of two coils, one in parallel with a condenser as a time constant control to operate the device as a flasher and the other to operate it as a buzzer.

3,614,771
DISPLAY APPARATUS

Ian T. Band, Los Altos, and Howard C. Borden, Atherton, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Sept. 18, 1969, Ser. No. 859,087
Int. Cl. G09f *9/34*
U.S. Cl. 340—336 **8 Claims**

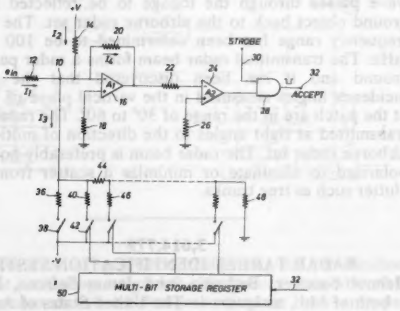


A multiple-place alphanumeric character display includes for each place character to be displayed a plurality of discrete light sources arranged at selected interstices in a matrix array. The characters are formed and displayed more rapidly than in conventional techniques by sequentially scanning symmetrical halves of the digits that form the display.

3,614,772
ANALOG-TO-DIGITAL CONVERTER

T. O. Paine, Deputy Administrator of the National Aeronautics and Space Administration with respect to an invention of; Wallace R. Finley, Albuquerque, N. Mex., and Jay A. Cox, Rolling Hills, Calif.

Filed Mar. 27, 1970, Ser. No. 23,132
Int. Cl. H03k *13/04*
U.S. Cl. 340—347 AD **2 Claims**

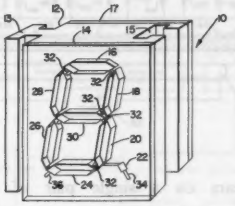


An analog-to-digital converter which utilizes an offset voltage to eliminate problems of offset errors, the conversion being performed on the ratio of the unknown analog signal to the offset voltage.

3,614,773
INDICATOR GLOW TUBE

Bernard M. Gordon, Magnolia, Mass., assignor to Gordon Engineering Company, Wakefield, Mass.

Filed June 30, 1969, Ser. No. 837,557
Int. Cl. G09f *9/30*
U.S. Cl. 340—343 **14 Claims**

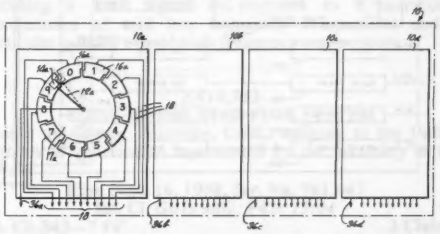


In an indicator tube, of the glow discharge type, a dielectric body is formed with a plurality of cutouts in a profile corresponding to different intelligence symbols. All cutouts communicate with each other through ports and contain a gaseous discharge medium. Portions of each cutout are coated with a conductor to form a pair of electrodes. A symbol is displayed by the indicator tube when the electrodes of selected cutouts are energized.

3,614,774
ANALOG-TO-DIGITAL SHAFT ENCODER WITH ANTIAMBIGUITY BINARY DIGITAL CODE OUTPUT

Thomas C. Clements, New York, N.Y., assignor to Neptune Meter Company, New York, N.Y.

Filed May 31, 1968, Ser. No. 733,392
Int. Cl. G08c *9/08, 19/34*
U.S. Cl. 340—347 P **11 Claims**



An analog-digital converter, especially adapted for use in reading utility meters, according to which decimal digits are encoded into binary signals, the binary code being unique in that it is of constant and even parity for both the main characters, representing the normal decimal digits, and for those characters which represent ambiguous states between decimal digits. As a result, ambiguities which occur in the reading of nonindexing registers are encoded with no special logic and with the simplest possible shaft encoder.

3,614,775
OPTICAL ENCODER WITH PNPN DIODE SENSING

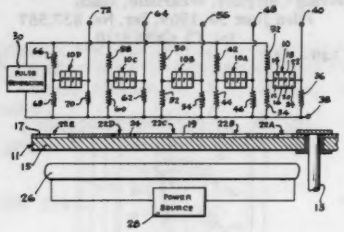
John W. Brean, Cincinnati, Ohio, assignor to D. H. Baldwin Company, Cincinnati, Ohio

Filed Sept. 18, 1968, Ser. No. 760,594
Int. Cl. G08c *9/06;* **H03k** *13/02*
U.S. Cl. 340—347 P **4 Claims**

An optical analog-to-digital encoder is disclosed employing light responsive PNPN switching diodes to respond to transparent sectors of a code member. The encoder utilizes a constant light source and an electrical pulse generator connected to the diodes for sampling.

In one embodiment of the encoder a separate output is

obtained for each of a plurality of switching diodes. In another embodiment, the output of a plurality of switching



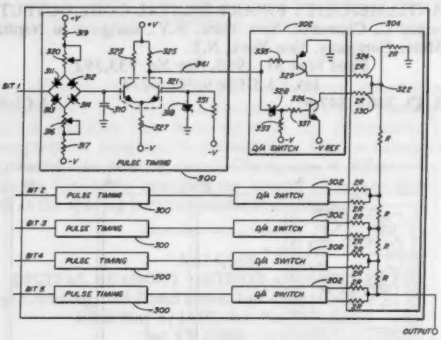
diodes appears on a single pair of output terminals sequentially.

3,614,776

PULSE SYNCHRONIZATION FOR DIGITAL TO ANALOG CONVERTERS

Dean B. Eshleman, Lincoln, and Alice M. D'Entremont, Boston, both of Mass., assignors to Control Data Corporation, Minneapolis, Minn.

Filed Nov. 19, 1968, Ser. No. 777,123
Int. Cl. H03k *13/02*
U.S. Cl. 340—347 DA **6 Claims**



A method and apparatus for performing the method for eliminating transients at the output of a digital to analog (D/A) converter is disclosed. Pulses representing all bits of a multibit digital word applied to a D/A converter are time synchronized by independently delaying their leading and trailing edges. The delay is achieved by integrating the pulse edges of all bits at a variable rate and applying the integrated pulse edges to a threshold circuit to recover them. Varying the integration rate of the various bits allows the time synchronization.

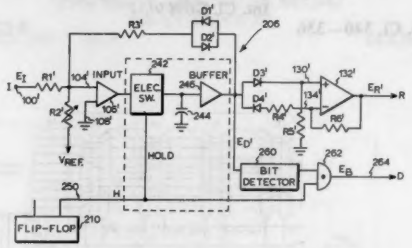
3,614,777

ANALOG-TO-DIGITAL CONVERTER

Roy P. Foerster, Thousand Oaks, Calif., assignor to The Bunker-Ramo Corporation, Oak Brook, Ill.

Continuation-in-part of application Ser. No. 645,191, June 12, 1967. This application June 9, 1969, Ser. No. 831,467
Int. Cl. H03k *13/06*
U.S. Cl. 340—347 AD **11 Claims**

A converter system employing clock controlled data propagation for rapidly converting analog input signals to "reflected binary" or Gray code output signals. The system is comprised of a plurality of substantially identical stages, each capable of providing both a bit output signal and a residual analog output signal in response to an analog input signal. Each stage alternately operates in an "acquisition" mode in which the input portion of the stage slews to, and tracks, the stage input voltage and a "hold" mode in which the stage input portion stops tracking and holds constant at the level of the input signal immediately prior to the start of the hold



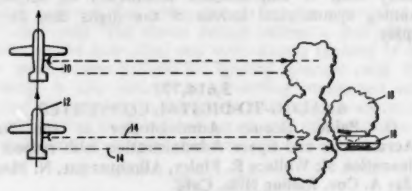
command. The stages are interconnected in a manner which permits each stage to start converting a subsequent analog input signal promptly after it forms its bit with respect to the preceding analog input signal and prior to propagation of the preceding analog input signal through all of the stages.

3,614,778

FINE RESOLUTION RADAR FOR FOLIAGE PENETRATION

Robert R. Graham; Keeve M. Siegel, and Weston E. Vivian, all of Ann Arbor, Mich., assignors to Conductron Corporation, Ann Arbor, Mich.

Filed Nov. 18, 1965, Ser. No. 508,731
Int. Cl. G01s *9/02*
U.S. Cl. 343—5 R **10 Claims**



A method and apparatus for detecting by airborne radar the presence of a ground object hidden beneath foliage or the like. The radar signal is transmitted at a frequency having a wavelength relatively long with respect to the dimensions of the foliage and the like so that the scatter of the transmitted signal wave due to foliage is minimized and the transmitted wave passes through the foliage to be reflected from the ground object back to the airborne radar set. The optimum frequency range has been determined to be 100 to 1,000 mHz. The transmitted radar beam forms a radar path on the ground and it has been discovered that the optimum incidence angles measured in the vertical plane of the beam at the patch are in the range of 30° to 60°. The radar beam is transmitted at right angles to the direction of motion of the airborne radar set. The radar beam is preferably horizontally polarized to eliminate or minimize a scatter from vertical clutter such as tree trunks.

3,614,779

RADAR TARGET IDENTIFICATION SYSTEM

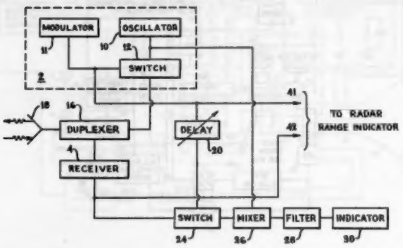
Helmut Sommer, Bethesda, and James Salerno, Rockville, both of Md., assignors to The United States of America as represented by the Secretary of the Army

Filed Dec. 14, 1962, Ser. No. 246,864
Int. Cl. G01s *9/02, 9/08*
U.S. Cl. 343—6 R **1 Claim**

1. The method of identifying an object detected by a short range, high-resolution radar having a transmitter which includes means for generating a pulse modulated continuous wave output signal, antenna means connected to said

transmitter for radiating the pulse modulated continuous wave output signal generated by said transmitter and for receiving reflected signals of the radiated signal, and a receiver connected to said antenna means, said method comprising the steps of

a. combining the reflected signals from said object with a constant phase signal of the same frequency over several pulse periods to produce a signal having the same frequency of the combined signals but which is amplitude modulated due to the variation in phase relation between said reflected signals and said constant phase signal caused by the vibration of said detected object,



b. filtering the amplitude modulated signal to detect the modulation signal, and

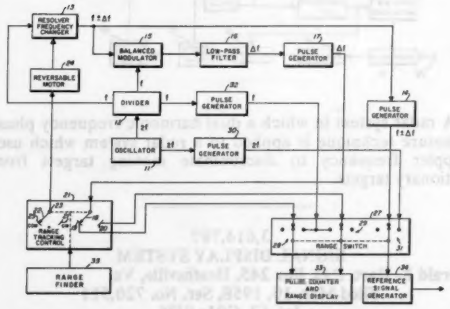
c. audibly reproducing the modulation signal to provide a continuous indication of the nature of said detected object.

3,614,780

CRYPTOGRAPHIC COMMUNICATION SYSTEM

Robert D. Isaak, and Woodrow H. Littrell, both of San Diego, Calif., assignors to the United States of America as represented by the Secretary of the Navy

Filed Dec. 6, 1961, Ser. No. 157,604
Int. Cl. G01s *9/02*; H04k *1/00*
U.S. Cl. 343—7 ED **6 Claims**



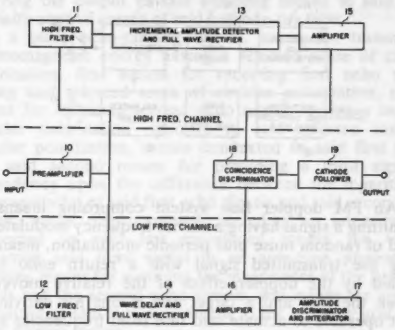
The invention as described comprising in combination, means for producing a signal 9 a frequency proportional to the instantaneous rate of change in distance between a pair of vessels, means for converting the frequency of said signal into parameters displayed in terms of instantaneous distance between said pair of vessels, means for generating a predetermined reference signal, and means connected between said frequency signal producing means and said converting and generating means for selectively driving said converting and generating means simultaneously or reversely with respect to each other.

3,614,781

DUAL CHANNEL DOPPLER FREQUENCY-SELECTIVE FUZE SYSTEM

Samuel W. Lichtman, Riverside, Calif., assignor to the United States of America as represented by the Secretary of the Navy

Filed Feb. 21, 1956, Ser. No. 567,037
Int. Cl. G01s *7/02*; F42c *13/04*
U.S. Cl. 343—7 PF **11 Claims**



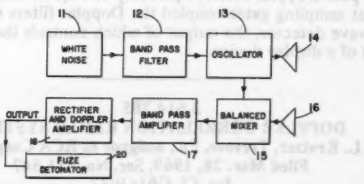
A frequency-selective fuze system comprising means for transmitting an RF signal and receiving an echo signal modified by the doppler frequencies resulting from the relative velocity between a missile carrying the fuze and a target aircraft means for deriving the doppler frequency spectrum from said received signal, means for disassociating the spectrum into two spectral bands consisting of low frequency components of the doppler signal and high-frequency components of the doppler signal, and means for initiating a burst signal in response to a coincident combination of said low frequency components and a particular portion of said high-frequency components.

3,614,782

NOISE-MODULATED FUZE SYSTEM

Donald J. Adrian, Riverside, Calif., assignor to the United States of America as represented by the Secretary of the Navy

Filed Sept. 16, 1958, Ser. No. 761,447
Int. Cl. G01s *9/02*; F42c *13/04*
U.S. Cl. 343—7 PF **3 Claims**

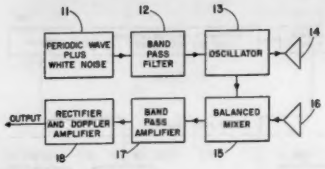


An FM doppler fuze system comprising means for transmitting a signal having a carrier frequency modulated by a band of random noise, means for mixing the transmitted signal with a return echo signal modified by the doppler effect of the relative movement between the fuze and a target-biased band pass amplifier means coupled to the output of said mixing means for blocking received signals within a predetermined range, and means coupled to the output of said band pass amplifier means responsive to received signals beyond said predetermined range for actuating said fuze.

3,614,783
FM CROSS-SIDEBAND FUSE SYSTEM

Donald J. Adrian, Arlington, Calif., assignor to the United States of America as represented by the Secretary of the Navy

Filed Sept. 23, 1958, Ser. No. 762,897
Int. Cl. G01s 9/02; F42c 13/04
U.S. Cl. 343—7 PF 8 Claims

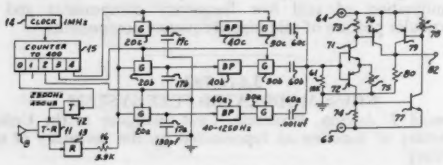


1. An FM doppler fuse system comprising means for transmitting a signal having a carrier frequency modulated by a band of random noise plus periodic modulation, means for mixing the transmitted signal with a return echo signal modified by the doppler effect of the relative movement between the fuse and a target and means for deriving an output operable to actuate said fuse from frequencies above the low-frequency doppler band of the output from said mixing means.

3,614,784
RANGE-GATED MOVING TARGET INDICATOR

Irving D. Richmond, Norwalk, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed Jan. 19, 1970, Ser. No. 4,005
Int. Cl. G01s 9/42
U.S. Cl. 343—7.7 20 Claims



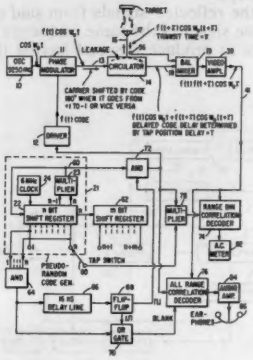
A range-gated moving target indicator comprises a plurality of sequentially actuated input sampling gates couping a video input to a corresponding plurality of storage capacitors. Each capacitor is coupled to a corresponding band-pass Doppler filter. A plurality of sequentially actuated output sampling gates coupled the Doppler filters to a single full-wave detector, the output of which controls the intensity input of a display device.

3,614,785
DOPPLER CORRELATION RADAR SYSTEM

Dale L. Kratzer, Trevose, Pa., assignor to RCA Corporation

Filed Mar. 28, 1969, Ser. No. 811,547
Int. Cl. G01s 9/42
U.S. Cl. 343—7.7 10 Claims

A continuous wave Doppler radar system which is modulated by a repetitive binary code in which the binary value of the bits of one-half the code vary in a pseudo-random manner and the bits of the other half of the code all have the same binary value is utilized to provide two time-multiplexed channels, one of which is an "all range" channel having a sound output and the other of which is a "range bins" channel having a visual output. The repetitive code utilized in the "all range" channel inherently provides this channel with a sensitivity time control (STC) that makes the sensitivity of the channel vary directly with the range to the target. In the "range bins" channel the Doppler characteristics of a particular target are derived by correlation of the return signal with the delayed portion of

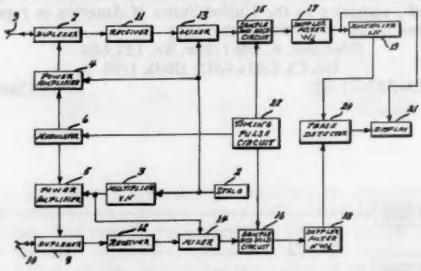


the transmitted signal to unambiguously determine the target range.

3,614,786
DUAL HARMONIC FREQUENCY MOVING TARGET INDICATOR RADAR

William B. Goggins, Jr., Dayton, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force

Filed Oct. 22, 1969, Ser. No. 868,438
Int. Cl. G01s 9/42, 9/44
U.S. Cl. 343—7.7 2 Claims



A radar system in which a dual harmonic frequency phase signature technique is applied to a radar system which uses doppler frequency to discriminate moving targets from stationary targets.

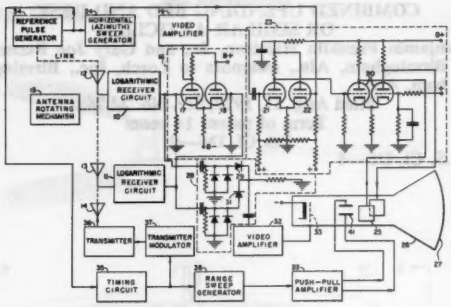
3,614,787
SIGNAL DISPLAY SYSTEM

Gerald E. Hart, P.O. Box 245, Heathsville, Va.

Filed Mar. 10, 1958, Ser. No. 720,511
Int. Cl. G01s 9/06
U.S. Cl. 343—11 R 9 Claims

In a pulse echo-ranging system, means for transmitting electromagnetic waves having a selected sense of circular polarization, first means for receiving first echo signals having said selected sense of circular polarization, second means for receiving second echo signals having a sense of circular polarization, said second means for receiving second echo signals having sense of circular polarization opposite to said selected sense of circular polarization, differencing means connected to said first means and said second means for generating third signals in dependency upon the difference in magnitude of said first echo signals and said second echo signals, azimuth sweep-generating means for generating fourth signals, pulse-timing means for generating

fifth signals, means connected to said azimuth sweep-generating means and said pulse-timing means for synchronizing the start of said pulse-timing means and said azimuth sweep-generating means, mixer means, means



connected between said mixer means and said differencing means for applying said third signals to said mixer means, means connected between said azimuth sweep-generating means and said mixer means for applying said fourth signals to said mixer means, range sweep-generating means, means for applying the output of said pulse-timing means to simultaneously trigger said transmitting means and said range sweep-generating means, summing means connected to said first and second means for generating a sixth signal in dependency upon the sum of the magnitudes of said first echo signals and said second echo signals, a cathode-ray tube having beam intensity control means and beam deflection means, means for applying the output of said mixer means and said range sweep-generating means to said beam deflection means of said cathode-ray tube, plus means for applying the output of said summing means to said beam intensity control means of said cathode-ray tube.

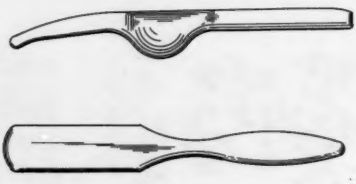
In a pulse echo-ranging system, means for transmitting electromagnetic energy having a selected sense of circular polarization, first means for receiving first echo signals having said selected sense of circular polarization, second means for receiving second echo signals having a sense of circular polarization opposite to said selected sense of circular polarization, means connected to said first means and said second means for providing a third signal in dependency upon the difference between the logarithm of the magnitudes of said first echo signals and said second echo signals, visual display means, including an intensity grid, connected to said last mentioned means for visually displaying said third signal in an area-type presentation, summing means for summing the magnitudes of the first echo signals and the second echo signals, and means for applying the output of said summing means to the intensity grid of the visual display means.

DESIGNS

OCTOBER 19, 1971

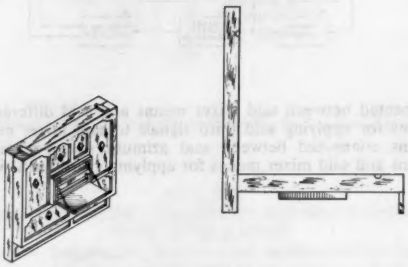
222,323
HANDLE STICK FOR A FROZEN CONFECTION
Alton W. Defee, 2320 Irving Blvd., Dallas, Tex. 75207
Filed June 22, 1970, Ser. No. 23,588
Term of patent 14 years
Int. Cl. D1—*99*
U.S. Cl. D1—99

222,324
HAIRBRUSH HANDLE
Dan E. Simon, 20142 Scottsdale Blvd., Shaker Heights, Ohio 44122
Filed May 14, 1970, Ser. No. 22,979
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—35

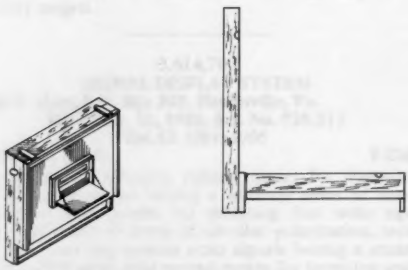


222,325
CLOWN BED
Howard S. Curtis, 1902 Glenfield Ave., Dallas, Tex. 75224
Filed June 16, 1970, Ser. No. 23,506
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D5—4

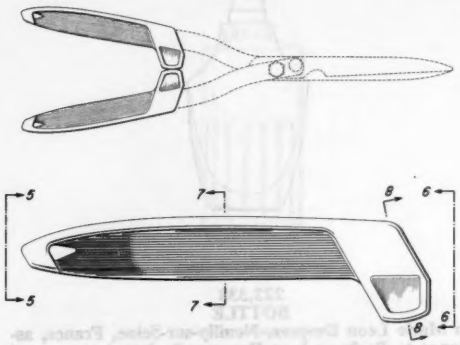
222,326
COMBINED UPENDING BED AND DESK OR SIMILAR ARTICLE
Benjamin Franklin Harrison, Jr., and Gary Joe Barnes, Birmingham, Ala., assignors to Lorch, Inc., Birmingham, Ala.
Filed Aug. 31, 1970, Ser. No. 24,762
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D5—4



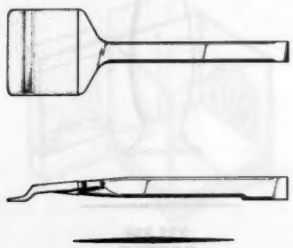
222,327
COMBINED UPENDING BED AND DESK OR SIMILAR ARTICLE
Benjamin Franklin Harrison, Jr., and Gary Joe Barnes, Birmingham, Ala., assignors to Lorch, Inc., Birmingham, Ala.
Filed Aug. 31, 1970, Ser. No. 24,763
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D5—4



222,328
HANDLE
John S. Vecchione, Sturbridge, Mass., assignor to Parker Manufacturing Company, Worcester, Mass.
Filed June 17, 1970, Ser. No. 23,529
Term of patent 14 years
Int. Cl. D8—*01*
U.S. Cl. D8—5



222,329
CARPET TOOL
John F. Cuscovitch, 42 Woodbridge Ave., East Hartford, Conn. 06108
Filed July 13, 1970, Ser. No. 23,937
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—15



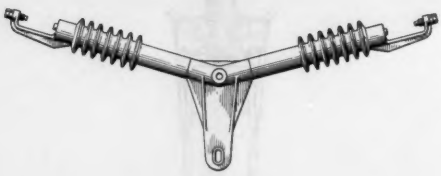
222,330
ELECTRIC CAN OPENER
Monte L. Levin, New York, N.Y., assignor to Scovill Manufacturing Company, Waterbury, Conn.
Filed June 3, 1970, Ser. No. 23,269
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—36

222,331
VALVE SPRING COMPRESSING TOOL
William E. Shultz, 239 N. Main St., Lombard, Ill. 60148
Filed July 20, 1970, Ser. No. 24,020
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—51

222,332
ELECTRIC SCISSORS
Wayne A. Current, Cranford, N.J., assignor to The Singer Company, New York, N.Y.
Filed Aug. 28, 1970, Ser. No. 24,757
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—61

222,333
PITON
William A. Feuerer, 2009½ Oak St., Santa Monica, Calif. 90405
Filed Apr. 23, 1970, Ser. No. 22,579
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—230

222,334
ELECTRICAL CONDUCTOR SUPPORT
Paul E. Lewis, Mexico, and Robert W. Harmon, Centralia, Mo., assignors to A. B. Chance Company, Centralia, Mo.
Original design application July 8, 1969, Ser. No. 18,108, now Patent No. D. 219,332, dated Dec. 1, 1970. Divided and this application June 24, 1970, Ser. No. 23,628
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D8—230



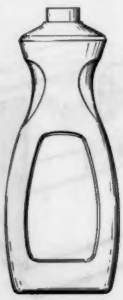
222,335
JUG OR SIMILAR ARTICLE
Ted L. Beaver, Roselle, Ill., assignor to Continental Can Company, Inc., New York, N.Y.
Filed Feb. 2, 1970, Ser. No. 21,299
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—47

222,336
BOTTLE
Donald J. Leary, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed July 1, 1970, Ser. No. 23,785
Term of Patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—87

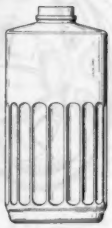
222,337
BOTTLE
Richard L. Weckman, Perrysburg, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed Sept. 8, 1970, Ser. No. 24,886
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—115

222,338
BOTTLE
Jean Marie Leon Desprez, Neuilly-sur-Seine, France, assignor to Parfums Jean Desprez, Societe Anonyme of France, Neuilly-sur-Seine, France
Filed May 20, 1970, Ser. No. 23,110
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—115

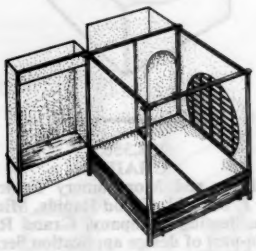
222,339
BOTTLE
James E. Plummer, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed July 1, 1970, Ser. No. 23,784
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—115



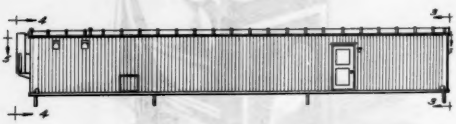
222,340
BOTTLE
Richard L. Weckman, Perrysburg, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed July 1, 1970, Ser. No. 23,782
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—158



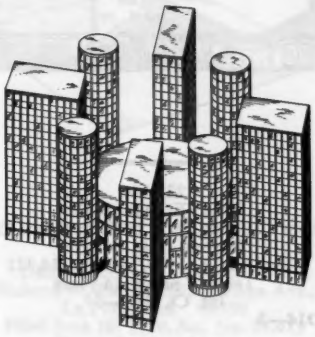
222,341
TEA ROOM UNIT
Soshitsu Sen, 613 Ogawadori, Teranouchiagaru, Hompopimae-cho, Kamikyo-ku, Kyoto, Japan
Filed Dec. 18, 1969, Ser. No. 20,553
Claims priority, application Japan June 21, 1969
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1



222,342
MOBILE KINDERGARTEN FACILITY
James T. Glisson, Evinston, Fla., assignor to Motivation Systems, Inc., Gainesville, Fla.
Filed Jan. 2, 1970, Ser. No. 20,741
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1



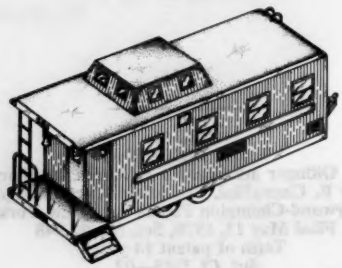
222,343
BUILDING COMPLEX
Charles F. Mullen, 243 W. Mount Royal Road, Milwaukee, Wis. 53217
Original design application July 19, 1968, Ser. No. 12,830. Divided and this application Feb. 19, 1970, Ser. No. 21,927
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1



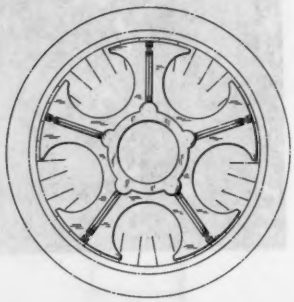
222,344
WALL PANELING
Lester V. Ottinger and Robert E. James, Danbury, and Andrew E. Carmellini, Brookfield, Conn., assignors to U.S. Plywood-Champion Papers Inc., New York, N.Y.
Filed May 13, 1970, Ser. No. 22,948
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D13—1

222,345
BUILDING
James Robert McGlashon, Olathe, Kans., assignor to New Trends, Inc., Kansas City, Mo.
Filed Sept. 28, 1970, Ser. No. 25,235
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1

222,346
TRAVEL TRAILER
William C. Schmelzer, 118 Briar Heath Circle, Dayton, Ohio 45415
Filed Aug. 5, 1970, Ser. No. 24,321
Term of patent 14 years
Int. Cl. D12—*03*
U.S. Cl. D14—3

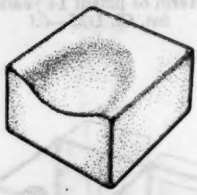


222,347
BICYCLE WHEEL COVER
Orlando B. Fornataro, 201 Nemo St., New Castle, Pa. 16101
Filed June 10, 1970, Ser. No. 23,428
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D14—30

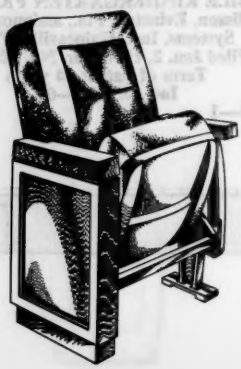


222,348
WHEEL
Millard Fillmore Harty, Jr., Bloomfield Hills, Mich., assignor to Motor Wheel Corporation, Lansing, Mich.
Filed Oct. 1, 1970, Ser. No. 25,286
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D14—30

222,349
FURNITURE CUSHION OR SIMILAR ARTICLE
Christen Wilhner Sorensen, 210 Darwin Park, Nun's Island, Montreal, Quebec, Canada
Filed Oct. 24, 1969, Ser. No. 19,706
Claims priority, application Canada Sept. 29, 1969
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D15—8

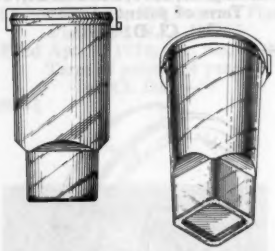


222,350
CHAIR
Carl W. Sundberg and Montgomery Ferar, Southfield, and Chester J. Barecki, Grand Rapids, Mich., assignors to American Seating Company, Grand Rapids, Mich.
Continuation-in-part of design application Ser. No. 16,840, Apr. 21, 1969. This application May 13, 1970, Ser. No. 22,965
Term of patent 14 years
Int. Cl. D6—*02*
U.S. Cl. D15—8



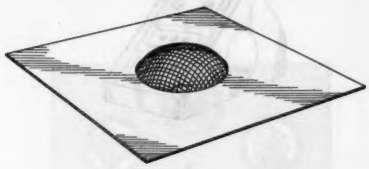
222,351
CHAIR
George Mergenov, 80 Oaks St., Closter, N.J. 07624
Filed July 6, 1970, Ser. No. 23,826
Term of patent 14 years
Int. Cl. D6—*02*
U.S. Cl. D15—11

222,352
DISPOSABLE VIAL FOR BLOOD CELL COUNTING
Patrick V. Ferro, Miami Lakes, and Laureston C. Brown, Miami Springs, Fla., assignors to Coulter Diagnostics, Inc., Hialeah, Fla.
Filed Apr. 23, 1970, Ser. No. 22,601
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D16—1

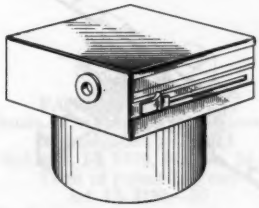


222,353
FISHING LURE
Joseph Dexter Mills, 158 Crittendon Ave. NE., Roanoke, Va. 24012
Filed Aug. 5, 1970, Ser. No. 24,308
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—29

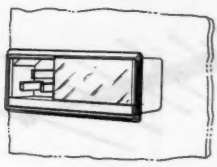
222,354
FLAT ROOF DRAIN
Charles J. Foltz, 6660 Shannon Ave., San Diego, Calif. 92115, and Bernard J. Tomonelli, 1320 Sommermount Drive, El Cajon, Calif. 92020
Filed Feb. 16, 1970, Ser. No. 21,449
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—42



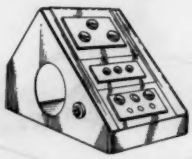
222,355
DEODORIZER OR THE LIKE
Richard W. Farris, 1508 Indiana Ave., La Porte, Ind. 46350
Filed June 10, 1970, Ser. No. 23,413
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—150



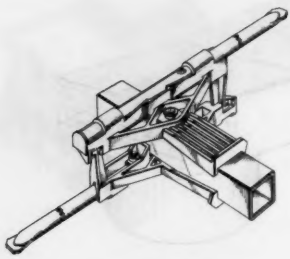
222,356
POWER MODULE
Allen E. Inhelder, Mountain View, and Richard L. Hoogner, Sunnyvale, Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.
Filed June 18, 1970, Ser. No. 23,547
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—1



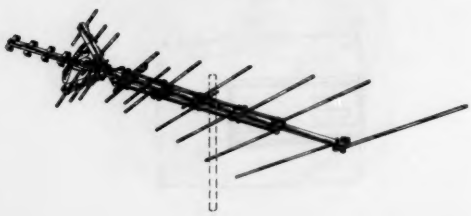
222,357
CASING FOR COMMUNICATIONS EQUIPMENT OR THE LIKE
Albert Locher, 1905 Peck Road, Monrovia, Calif. 91016
Filed Mar. 20, 1970, Ser. No. 21,990
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—5



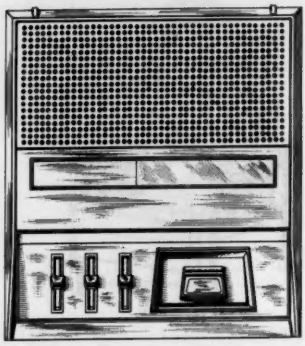
222,358
ANTENNA
Franklin Roosevelt Di Meo, Woodbury, N.J., and Neil Worral Burwell, deceased, late of Moorestown, N.J., by Shirley D. Burwell, legal representative, Moorestown, N.J., assignors to RCA Corporation
Filed Dec. 29, 1969, Ser. No. 20,656
Term of patent 14 years
Int. Cl. D14—*99*
U.S. Cl. D26—14

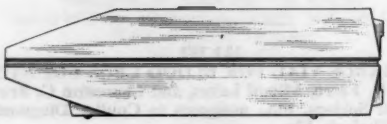


222,359
ANTENNA FOR A RADIO OR TELEVISION SET
Donald William Peterson, Maple Shade, N.J., assignor to RCA Corporation
Filed May 27, 1970, Ser. No. 23,164
Term of patent 14 years
Int. Cl. D14—*03, 99*
U.S. Cl. D26—14

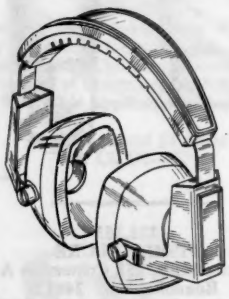


222,360
CASSETTE TAPE RECORDER
John S. Maliskas, North Syracuse, N.Y., assignor to General Electric Company
Filed June 5, 1970, Ser. No. 23,335
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—14

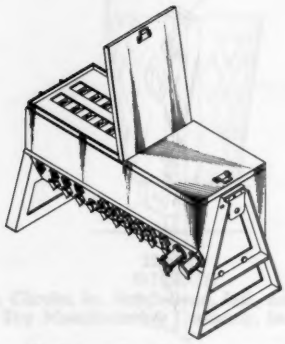




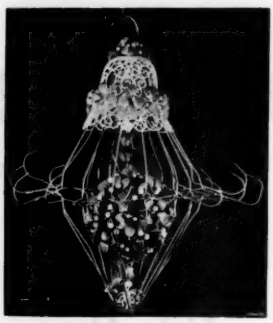
222,361
HEADPHONE
Richard S. Hart, Wheaton, Ill., assignor to The Telex Corporation, Tulsa, Okla.
Filed Aug. 26, 1970, Ser. No. 24,704
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—14



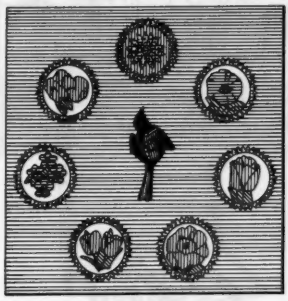
222,362
ELECTRIC POWER DISTRIBUTION APPARATUS
James R. Williams, Berkeley, Calif., assignor to Williams & Lane, Inc.
Filed Dec. 24, 1969, Ser. No. 20,647
Term of patent 14 years
Int. Cl. D13—*01, 02*
U.S. Cl. D26—15



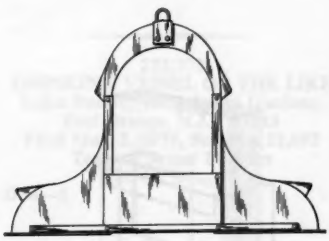
222,363
DECORATIVE HANGING INCLUDING SKELETAL FRAMEWORK
Clifton Bullard, 310 Prescott Place, Plainfield, N.J. 07063
Filed Apr. 6, 1970, Ser. No. 22,257
Term of patent 14 years
Int. Cl. D11—*04*
U.S. Cl. D29—1



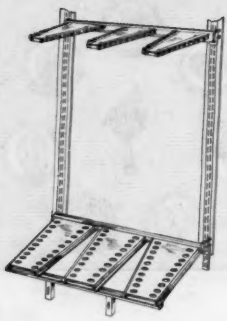
222,364
PLAQUE
Nestor A. Kmicikewicz, 916 Cardero St., Vancouver 5, British Columbia, Canada
Filed Aug. 13, 1970, Ser. No. 24,480
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D29—23



222,365
FARROWING HOUSE
Claude W. Ahrens, West Highway 6, Grinnell, Iowa 50112
Filed Sept. 14, 1970, Ser. No. 24,979
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—1



222,366
BILLIARD CUE RACK
Samuel H. Berger, Skokie, Ill., assignor to Ajax Enterprises Corporation, Delavan, Wis.
Filed Feb. 27, 1970, Ser. No. 21,659
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D33—3

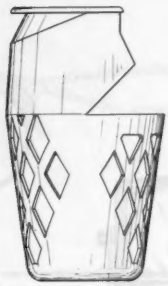


222,367
PAPER BAG HOLDER
Robert C. Goss, 505 N. Western, Oklahoma City, Okla. 73106
Filed Apr. 2, 1970, Ser. No. 22,215
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D33—3

222,368
END STANDARD FOR A GUN RACK
George J. Smith, Birmingham, Ala., assignor to Just-O Corporation
Filed May 21, 1970, Ser. No. 23,088
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D33—3

222,369
MODULAR CABINET
Charles E. Schroer, Columbus, Ind., and John J. Hamilton, Avon, Conn., assignors to Hamilton Cosco, Inc., Columbus, Ind.
Original design application Dec. 26, 1968, Ser. No. 15,125, now Patent No. 217,558. Divided and this application Mar. 2, 1970, Ser. No. 21,677
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D33—19

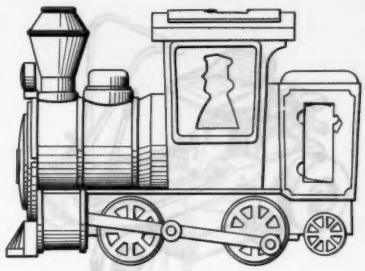
222,370
BILLIARD TABLE POCKET
Theodore Silverman, 230 Broadway, Denver, Colo. 80203
Filed Aug. 13, 1970, Ser. No. 24,463
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—3



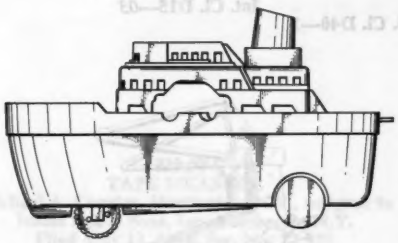
222,371
WICKET
Louis R. Chreist, Jr., South Bend, Ind., assignor to South Bend Toy Manufacturing Company, Inc., South Bend, Ind.
Filed Aug. 5, 1970, Ser. No. 24,327
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5

222,372
GOLF CLUB
Harold A. Thomas, Murrysville, Pa., assignor to Harvey L. Hensel, Frankfort, Mich.
Filed Aug. 20, 1970, Ser. No. 24,611
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5

222,373
TOY LOCOMOTIVE
Tachi Ichiro, Fujisawa, Japan, assignor to Kabushiki Kaisha Asakusa Gangu, Tokyo, Japan
Filed Nov. 10, 1970, Ser. No. 25,918
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15



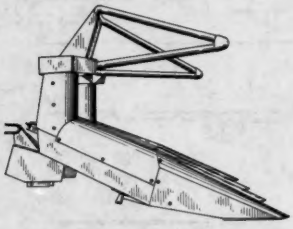
222,374
TOY SHIP
Tachi Ichiro, Fujisawa, Japan, assignor to Kabushiki Kaisha Asakusa Gangu, Tokyo, Japan
Filed Nov. 10, 1970, Ser. No. 25,919
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15

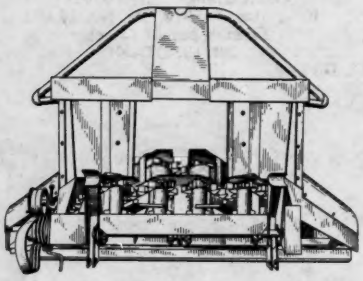


222,375
DRINKING VESSEL OR THE LIKE
Lajos Bencik, 19 Melmore Gardens, East Orange, N.J. 07018
Filed Mar. 2, 1970, Ser. No. 21,692
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D36—8

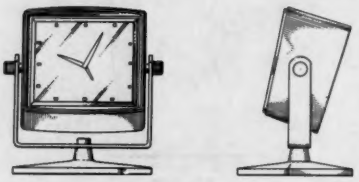
222,376
RIDING MOWER
Robert B. Mead, Wilmington, Ohio, assignor to Mast-Foos Manufacturing Company, Inc., Springfield, Ohio
Filed May 27, 1970, Ser. No. 23,170
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D40—1

222,377
FORAGE HARVESTER HEADER
Ferol S. Fell, Newton, William D. Long, Hesston, and Kenneth R. McMillen, Moundridge, Kans., assignors to Hesston Corporation, Hesston, Kans.
Filed June 3, 1970, Ser. No. 23,274
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D40—1





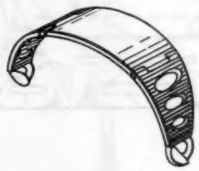
222,378
CLOCK
Daniel A. Berkoff, Sherman Oaks, Calif., assignor to Hollywood Accessories (a division of Orion Industries Inc.), El Segundo, Calif.
Filed Sept. 14, 1970, Ser. No. 24,957
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D42—7



222,379
COFFEE PERCOLATOR
Renato Piovani, Via Donato 66/3, Bologna, Italy
Continuation-in-part of design application Ser. No. 20,488, Dec. 15, 1969. This application Aug. 18, 1970, Ser. No. 24,557
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D44—26

222,380
PIZZA PIE CUTTER
Joseph Fraioli, Sr., New York, N.Y.
(300 Martine Ave., White Plains, N.Y. 10601)
Filed Apr. 22, 1970, Ser. No. 22,567
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D44—29

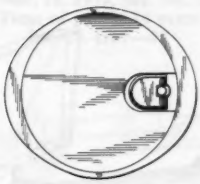
222,381
LINKAGE FOR AN IDENTIFICATION BRACELET OR SIMILAR ARTICLE
Raymond C. Fontaine, Greenville, R.I., assignor to Textron Inc., Providence, R.I.
Filed Mar. 2, 1970, Ser. No. 21,702
The portion of the term of the patent subsequent to July 14, 1984, has been disclaimed
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—4



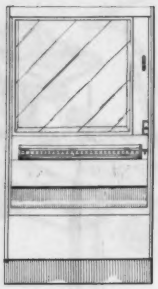
222,382
SEWER CLEANER HOUSING
Charles E. Freese, Erie, Pa., assignor to Emerson Electric Co., St. Louis, Mo.
Filed Apr. 22, 1970, Ser. No. 22,573
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D49—10

222,383
TEAT CUP INFLATION PUNCH AND AIR VENT CLEANER
Daniel O. Noorlander, 5707 N. Bond St., Fresno, Calif. 93726
Filed June 26, 1970, Ser. No. 23,694
Term of patent 14 years
Int. Cl. D8—*99*; D30—*99*
U.S. Cl. D49—22

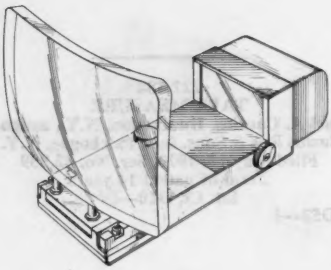
222,384
TAPE MEASURE
Michael A. Cousins, Huntington, N.Y., assignor to Justus Roe & Sons, Inc., Patchogue, N.Y.
Filed May 12, 1970, Ser. No. 22,939
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D52—1

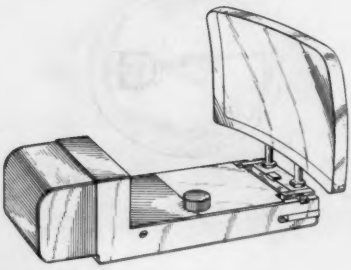


222,385
VENDING MACHINE CABINET
Walter L. Koch, Caldwell, Robert P. Franklin, Jefferson Township, and George R. Huyler, Hanover, N.J., assignors to Rowe International, Inc., Whippany, N.J.
Filed Apr. 1, 1970, Ser. No. 22,164
Term of patent 14 years
Int. Cl. D20—*01*
U.S. Cl. D52—3

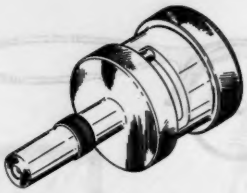


222,386
AIRCRAFT LANDING UNIT
Robert K. Kirschner, Bellevue, Wash., assignor to Sundstrand Data Control, Inc.
Filed May 15, 1970, Ser. No. 22,994
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D52—6

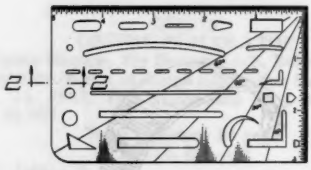




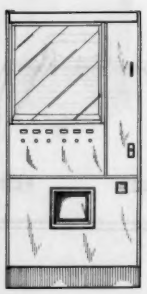
222,387
PRECISION INTERNAL THREAD GAUGE
George E. Mock, Phoenix, Ariz., assignor to Osborn Products, Inc., Phoenix, Ariz.
Filed Sept. 1, 1970, Ser. No. 24,792
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D52—6



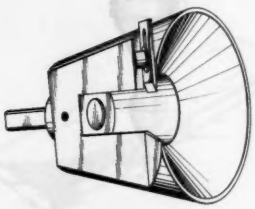
222,388
COMBINED RULE, PROTRACTOR AND ERASING SHIELD
Charles R. Meldrum, Detroit, Mich., assignor of fractional part interest to Robert G. Mentag, Detroit, Mich.
Filed Sept. 25, 1970, Ser. No. 25,196
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D52—6



222,389
VENDING MACHINE CABINET
Walter L. Koch, Caldwell, Robert P. Franklin, Jefferson Township, and George R. Huyler, Hanover, N.J., assignors to Rowe International, Inc., Whippany, N.J.
Filed Apr. 1, 1970, Ser. No. 22,165
Term of patent 14 years
Int. Cl. D20—*01*
U.S. Cl. D52—3

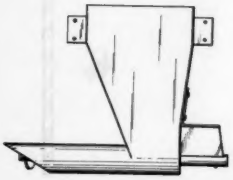


222,390
PORTABLE DOWEL HEAD CUTTER
Normand A. Pinette, 1207 Lakeview Ave., Lowell, Mass. 01854
Filed July 6, 1970, Ser. No. 23,844
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D54—4

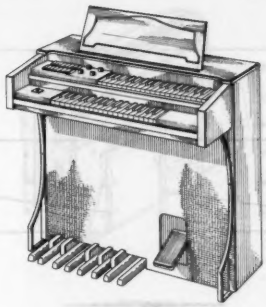


222,391
FORK OR SIMILAR ARTICLE
James Russell Price, Esmond, R.I., assignor to Textron Inc., Providence, R.I.
Filed Aug. 24, 1970, Ser. No. 24,662
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D54—12

222,392
VALVE BAG PACKER
Murland L. Taylor, 2521 Washington, Parsons, Kans. 67357
Filed May 14, 1970, Ser. No. 22,969
Term of patent 14 years
Int. Cl. D15—*08*
U.S. Cl. D55—1



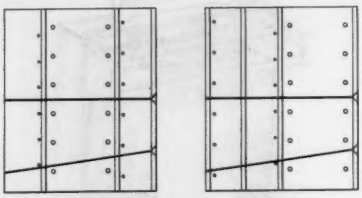
222,393
ORGAN CONSOLE
Thomas E. Kimble, Covington, Ky., assignor to D. H. Baldwin Company, Cincinnati, Ohio
Filed Nov. 16, 1970, Ser. No. 25,987
Term of patent 14 years
Int. Cl. D17—*01*
U.S. Cl. D56—2



222,394
PIANO
Winsor D. White, Jr., Blowing Rock, N.C., assignor to D. H. Baldwin Company, Cincinnati, Ohio
Filed Nov. 16, 1970, Ser. No. 25,994
Term of patent 14 years
Int. Cl. D17—*01*
U.S. Cl. D56—9

222,395
PIANO
Winsor D. White, Jr., Blowing Rock, N.C., assignor to D. H. Baldwin Company, Cincinnati, Ohio
Filed Nov. 16, 1970, Ser. No. 26,024
Term of patent 14 years
Int. Cl. D17—*01*
U.S. Cl. D56—9

222,396
MOTION PICTURE FILM SPLICER
Leonard Dickstein, 206 W. 22nd St., Deer Park, N.Y. 11729, and Barry Green, 732 De Mott Court, Westbury, N.Y. 11590
Filed Dec. 8, 1969, Ser. No. 20,407
Term of patent 14 years
Int. Cl. D16—*07*
U.S. Cl. D61—1

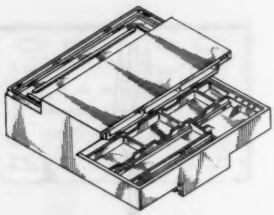


222,397
WARNING SIGN
Juil William Cathey, Jr., 2839 Wooded Acres, Waco, Tex. 76701
Filed May 8, 1970, Ser. No. 22,898
Term of patent 14 years
Int. Cl. D29—*99*
U.S. Cl. D72—1

222,398
PEDESTRIAN SIGNAL
John E. Roberts, 2198 Garden Drive, Wickliffe, Ohio 44092
Filed July 8, 1970, Ser. No. 23,866
Term of patent 14 years
Int. Cl. D29—*99*
U.S. Cl. D72—1

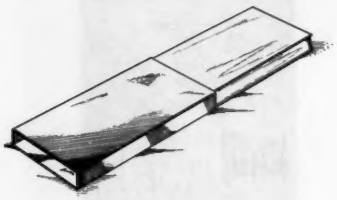
222,399
CARD PUNCHING STYLUS
Ira G. Laws and Edward J. Crossland, Tulsa, Okla., assignors to Seismograph Service Corporation, Tulsa, Okla.
Filed Dec. 2, 1968, Ser. No. 14,753
Term of patent 14 years
Int. Cl. D19—*99*
U.S. Cl. D74—1

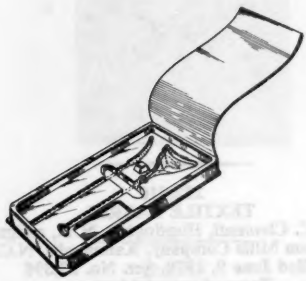
222,400
DESK TRAY FOR A RUBBER STAMP SIGN KIT
Jack G. Barnes, Alameda County, Calif. (19485 Meekland Ave., Hayward, Calif. 94541)
Continuation-in-part of design application Ser. No. 15,763, Feb. 13, 1969. This application May 26, 1970, Ser. No. 23,153
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D74—5



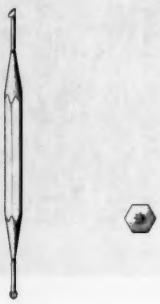
222,401
PENCIL
Perry Feuer, Roslyn, N.Y., assignor to Creative Creations, Inc., New York, N.Y.
Filed Sept. 23, 1970, Ser. No. 25,165
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D74—24

222,402
STERILE PACKAGE
Michael S. Burnhill, Brooklyn, N.Y., assignor to American Caduceus Industries, Inc., New York, N.Y.
Filed Aug. 10, 1970, Ser. No. 24,390
Term of patent 14 years
Int. Cl. D24—*02*; D9—*04*
U.S. Cl. D83—1

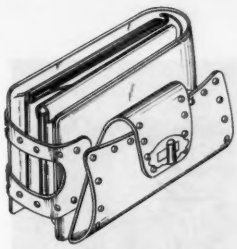




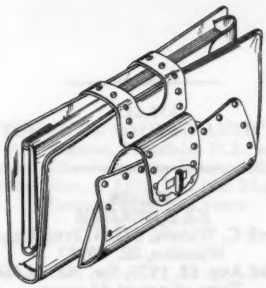
222,403
EYE SURGICAL TOOL
Ely Jay Crary, 4730 Austell Road, Austell, Ga. 30001
Filed Oct. 1, 1970, Ser. No. 25,287
Term of patent 14 years
Int. Cl. D24—*03*
U.S. Cl. D83—12



222,404
COMBINED WALLET AND EYEGLASS CASE
Murray Wolf, Union, N.J., assignor to Evans-Aristocrat Industries, Inc., Elizabeth, N.J.
Filed Jan. 24, 1969, Ser. No. 15,490
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—3



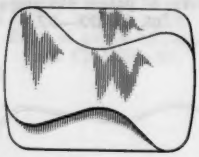
222,405
COMBINED WALLET AND EYEGLASS CASE
Murray Wolf, 849 Niles Road, Union, N.J. 07083
Original design application Jan. 24, 1969, Ser. No. 15,490. Divided and this application Dec. 8, 1969, Ser. No. 20,410
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—3



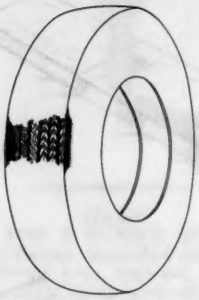
222,406
HANDBAG OR THE LIKE
Benjamin Krifchin, Baltimore, Md., assignor to General Crafts Corporation, Baltimore, Md.
Filed Aug. 4, 1970, Ser. No. 24,297
Term of patent 3½ years
Int. Cl. D3—*02*
U.S. Cl. D87—3

222,407
CARRYING CASE FOR A CAMERA OR THE LIKE
Vincent F. Lang, Rochester, N.Y., assignor to Eastman Kodak Co., Rochester, N.Y.
Filed Nov. 9, 1970, Ser. No. 25,904
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D87—5

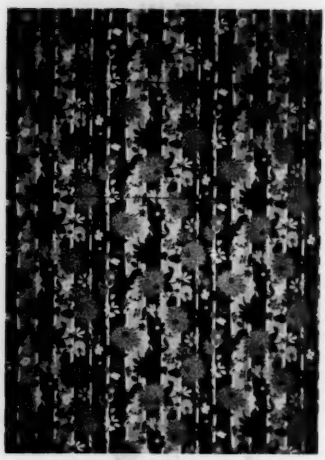
222,408
KEY HOLDER
Jack C. Watson, 626 N. President, Wheaton, Ill. 60187
Filed Aug. 12, 1970, Ser. No. 24,460
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—8



222,409
PNEUMATIC TIRE
William K. Pope, Mount Clemens, Mich., assignor to Uniroyal, Inc., New York, N.Y.
Filed Aug. 19, 1970, Ser. No. 24,578
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D90—20

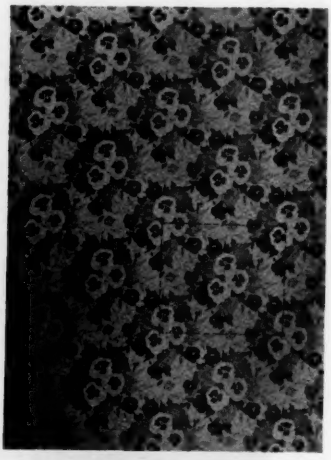


222,410
TEXTILE FABRIC
Leonard C. Clementi, Huntington, N.Y., assignor to Cannon Mills Company, Kannapolis, N.C.
Filed June 9, 1970, Ser. No. 23,395
Term of patent 14 years
Int. Cl. D5—*02*
U.S. Cl. D92—1

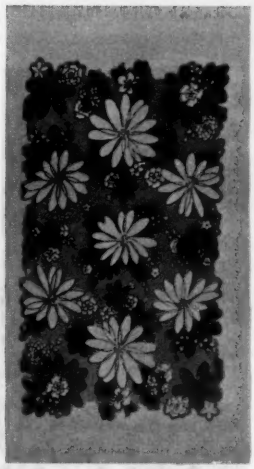


222,411
TOWEL OR SIMILAR ARTICLE
John W. Rock, Wyckoff, N.J., assignor to Cannon Mills Company, Kannapolis, N.C.
Filed Nov. 9, 1970, Ser. No. 25,879
Term of patent 14 years
Int. Cl. D6—*13*
U.S. Cl. D92—26

222,412
TEXTILE FABRIC
John W. Rock, Wyckoff, N.J., assignor to Cannon Mills Company, Kannapolis, N.C.
Filed Nov. 9, 1970, Ser. No. 25,880
Term of patent 14 years
Int. Cl. D5—*05*
U.S. Cl. D92—1

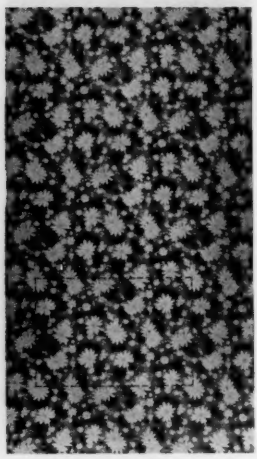


222,413
TOWEL OR SIMILAR ARTICLE
Nancy Ann Scherer, Plainfield, N.J., assignor to Cannon Mills Company, Kannapolis, N.C.
Filed Nov. 9, 1970, Ser. No. 25,881
Term of patent 14 years
Int. Cl. D6—*13*
U.S. Cl. D92—26

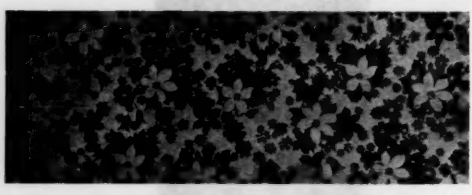


222,414
TOWEL OR SIMILAR ARTICLE
Nancy Ann Scherer, Plainfield, N.J., assignor to Cannon Mills Company, Kannapolis, N.C.
Filed Nov. 9, 1970, Ser. No. 25,882
Term of patent 14 years
Int. Cl. D6—*13*
U.S. Cl. D92—26

222,415
TEXTILE FABRIC
Nancy Ann Scherer, Plainfield, N.J., assignor to Cannon Mills Company, Kannapolis, N.C.
Filed Nov. 9, 1970, Ser. No. 25,883
Term of patent 14 years
Int. Cl. D5—*05*
U.S. Cl. D92—1



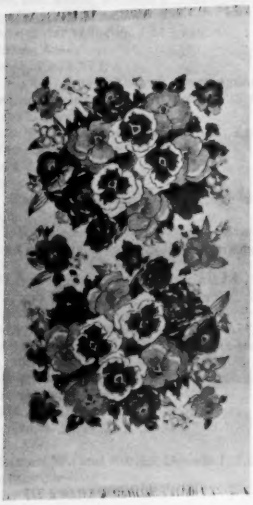
222,416
TEXTILE FABRIC
Leonard C. Clementi, Huntington, N.Y., assignor to Cannon Mills Company, Kannapolis, N.C.
Filed June 9, 1970, Ser. No. 23,397
Term of patent 14 years
Int. Cl. D5—*02*
U.S. Cl. D92—1



222,417
TEXTILE FABRIC
John W. Rock, Wyckoff, N.J., assignor to Cannon Mills Company, Kannapolis, N.C.
Filed Aug. 7, 1970, Ser. No. 24,373
Term of patent 14 years
Int. Cl. D5—*05*
U.S. Cl. D92—1

222,418
TOWEL OR SIMILAR ARTICLE
Joyce E. Haney, Post, Tex., assignor to Cannon Mills Company, Kannapolis, N.C.
Original design application Nov. 25, 1968, Ser. No. 14,635, now Patent No. 216,416, dated Dec. 30, 1969. Divided and this application Nov. 20, 1969, Ser. No. 20,192
Term of patent 14 years
Int. Cl. D6—*13*
U.S. Cl. D92—26

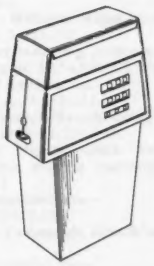
222,419
TOWEL OR SIMILAR ARTICLE
John W. Rock, Wyckoff, N.J., assignor to Cannon Mills Company, Kannapolis, N.C.
Filed Nov. 9, 1970, Ser. No. 25,878
Term of patent 14 years
Int. Cl. D6—*13*
U.S. Cl. D92—26



222,420
TOWEL OR SIMILAR ARTICLE
John W. Rock, Wyckoff, N.J., assignor to Cannon Mills Company, Kannapolis, N.C.
Filed Aug. 7, 1970, Ser. No. 24,374
Term of patent 14 years
Int. Cl. D6—*13*
U.S. Cl. D92—26

222,421
KNIFE
Terence Gerald Riley, Sheffield, England, assignor to Stanley Works (Great Britain) Limited, Woodside, England
Filed May 11, 1970, Ser. No. 22,906
Claims priority, application Great Britain Nov. 12, 1969
Term of patent 14 years
Int. Cl. D7—*03;* D8—*02*
U.S. Cl. D95—3

222,422
COMBINED ELECTRIC SHAVER AND HEAD PROTECTING CAP THEREFOR
E. Burton Benjamin, Highland Park, Ill., assignor to Electro Engineering Products Co., Inc.
Filed Sept. 22, 1969, Ser. No. 19,230
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D95—3



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 19TH DAY OF OCTOBER, 1971

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Aaron, Richard L.: *See—*
Stern, Elliott; and Aaron, Richard L.,3,613,265.

AB Gustavsbergs Fabriker: *See—*
Hellqvist, Ake Oscar Wilhelm, 3,613,890.

Abbott Laboratories: *See—*
Blasko, Joseph, 3,613,677.

Abild, Robert N., to United Aircraft Corporation. Rocket engine propellant feeding and control system. 3,613,375, Cl. 60-240.

Abromavage, John C.: *See—*
Ryden, James W.; and Abromavage, John C.,3,613,921.

Ace Filtercraft Inc.: *See—*
Nichols, Gerald L., 3,614,038.

Ackermann, Gunter: *See—*
Hoheisel, Rainer; Fischer, Berthold; and Ackermann, Gunter,3,613,716.

Adair, James Richard; and Bifasiewicz, Tadeusz M., to United Engineering and Foundry Company. Hot reversing strip mill method and apparatus. 3,613,426, Cl. 72-202.

Adams, Joe R. Therapeutic aid. 3,613,681, Cl. 128-293.

Adamski, Joseph; and Grim, James W., to Dura Corporation. Vehicle jack mechanism. 3,614,065, Cl. 254-122.

Adamski, Maxmilian; and Schover, Donald S., to General American Transportation Corporation. Sludge dewatering apparatus. 3,613,564, Cl. 100-118.

Adrian, Donald J., to United States of America, Navy. Noise modulated fuze system. 3,614,782, Cl. 343-7.

Adrian, Donald J., to United States of America, Navy. FM cross-sideband fuze system. 3,614,783, Cl. 343-7.

Adrian, Donald J.: *See—*
Lichtman, Samuel W.; and Adrian, Donald J.,3,613,590.

Aerosol Systems Inc.: *See—*
Beard, Walter C., 3,613,960.

Aerotron, Inc.: *See—*
Sauber, Charles R., 3,613,950.

AGA Aktiebolag: *See—*
Beer, Palle-Finn, 3,614,180.

Agfa-Gevaert Aktiengesellschaft: *See—*
Kisselmann, Willy; Rumpelein, Fritz; Landbrecht, Franz; and Knopf, Paul, 3,614,612.
Paulus, Rudolf, 3,614,455.

Ainsworth, David; and Atkinson, Cyril Millward, to Northrop Weaving Machine Limited. Stop motions for looms. 3,613,742, Cl. 139-336.

Air Balance, Inc.: *See—*
Amicone, Raymond George; Davey, Charles T.; and Dunning, Warren J., 3,613,795.

Air Products and Chemical Inc.: *See—*
Klee, David J., 3,613,386.

Aisin Seiki Kabushiki Kaisha: *See—*
Asano, Tadao; Yamaguchi, Hiroji; and Ishikawa, Kazuo, 3,613,844.
Masai, Hiroto, 3,613,847.
Tsubouchi, Kaoru, 3,613,837.

Akai Electric Company Limited: *See—*
Iwai, Katsuyuki; Fukatsu, Motonori; and Sato, Fujio, 3,614,308.

Akgulian, Sahag C.; Haffner, Donald G.; and Heth, Sherman C., to Jacobsen Manufacturing Company. Gang lawn mower. 3,613,337, Cl. 56-7.

Akgulian, Sahag C.; Haffner, Donald G.; and Heth, Sherman C., to Jacobsen Manufacturing Company. Tractor-driven lawn mower. 3,613,340, Cl. 56-249.

Aktiengesellschaft Brown, Boveri & Cie: *See—*
Baltensperger, Paul, 3,614,530.

Akustische u. Kino-Gerate Gesellschaft m.b.H.: *See—*
Gorike, Rudolf, 3,614,344.

Albright, Alva Z. Pick-up attachments for loaders and bulldozers. 3,613,923, Cl. 214-147.

Albro Fillers and Engineering Company Limited: *See—*
Cox, Victor Ian Malcolm, 3,613,858.

Alden, Milton, to Alden Research Foundation. Scanning apparatus support structure. 3,614,313, Cl. 178-7.6

Alden Research Foundation: *See—*
Alden, Milton, 3,614,313.

Alexandersson, Harald Valdemar, to Telefonaktiebolaget L M Ericsson. Multiple contact switching device for cross bar switches. 3,614,360, Cl. 200-166.

Alexandre Piq: *See—*
Gaston, Meneglier G., 3,613,713.

Alfa-Laval Bergedorfer Eisenwerke G.m.b.H.: *See—*
Ziller, Fritz, 3,613,892.

All-O-Matic Manufacturing Corporation: *See—*
Ballinger, J. R., 3,613,718.

Allard, John J.: *See—*
Woodward, Benjamin W.; and Allard, John J.,3,614,578.

Allastics, Inc.: *See—*
Holdredge, Ernest C., Jr., 3,613,605.

Allds, Raymond J., to Ashtabula Bow Socket Company. Method and apparatus for constructing convertible top linkages. 3,613,203, Cl. 29-155.

Allegheny Ludleum Steel Corporation: *See—*
Deverell, Harry E.; and Muscatell, Frank L., 3,613,433.

Allegheny Ludlum Steel Corporation: *See—*
Smith, Bernard, 3,613,489.

Allemand, Robert; Jacobe, Jean; and Roudaut, Edouard, to Commissariat A l'Energie Atomique. Neutron detection device for the position of beams of neutrons in space. 3,614,437, Cl. 250-83.1

Allen, Derek P., to Allen Medical Instruments, division of Bio-Dynamics Inc. Cutter for soft fibrous materials. 3,613,241, Cl. 30-294.

Allen, Herman. Balloon power turbine toy engine. 3,613,303, Cl. 46-206.

Allen Medical Instruments: *See—*
Allen, Derek P., 3,613,241.

Allen-Bradley Company: *See—*
Ford, David E., Jr.; and Waltz, Richard W., 3,614,596.

Alleo, Jackson Anthony, to Gentex Corporation. Protective helmet. 3,613,113, Cl. 2-3.

Allgaier, William A., to Sylvania Electric Products, Inc. Electron discharge device having novel indirectly heated cathode mounting. 3,614,513, Cl. 313-260.

Allis-Chalmers Manufacturing Company: *See—*
Burkhardt, Edgar S.; and Torrence, James D., 3,614,004.
Horn, John M., 3,613,721.
Weston, Donald E., 3,614,361.

Allmanna Srenska Elektriska Aktiebolaget: *See—*
Bank, Henning; Jilsen, Per-Owe; Klein, Hans; and Persson, Tage, 3,614,498.

Allmanna Svenska Elektriska Aktiebolaget: *See—*
Bielsten, Nils Ove, 3,613,442.
Johansson, Bengt; and Nilsson, Erland, 3,614,536.
Koranyi, Robert, 3,613,941.
Landa, Torstein; Syvakari, Perti; and Westman, Erik, 3,613,157.
Wedin, Kurt, 3,614,585.

Allmonna Svenska Elektriska Aktiebolaget: *See—*
Rudelius, Per; and Sallow, Ake, 3,613,625.

Alluminum Company of America: *See—*
Haddon, Roger C., 3,613,427.

Alside International Corporation: *See—*
Mollman, Robert E., 3,613,326.

Alter, Henry Ward; and Gilbert, Richard S., to General Electric Company. Ambient radioactivity air filter tester using a track-registration material. 3,614,421, Cl. 250-43.5

Altherr, Russell G., to Amsted Industries Incorporated. Rotary dump coupler. 3,613,902, Cl. 213-72.

Altland, George E.: *See—*
Stram, George H.; Williams, Ralph J.; Altland, George E.; and Dunn, Thomas J.,3,613,131.

Altman, Gerald. Reflex reflecting products, processes and devices useful with such products. 3,614,199, Cl. 350-105.

Aluminum Company of America: *See—*
Woodburn, Wilton A., 3,613,417.

Alvarez, William, to Jonathan Manufacturing Company. Flush bottom tank ball valve. 3,614,056, Cl. 251-144.

Amano, Takehisa, to Nippon Gakki Seizo Kabushiki Kaisha. Monophonic electronic musical instrument with variable filter. 3,614,288, Cl. 84-1.21

Ambac Industries, Incorporated: *See—*
Corey, Dwight O., 3,613,165.
Snyder, Warren E.; Cavanaugh, John B.; and Aubin, Jean-Paul R., 3,613,651.

American Cyanamid Company: *See—*
Soda, Keiichi; and Ueki, Masayuki, 3,613,170.

American Hoist & Derrick Company: *See—*
Wright, Colin S.; Fogelsong, Robert E.; Johnson, Jerold W.; and Jouhal, Teja S., 3,613,556.

American Hospital Supply Corporation: *See—*
Grow, Harry N.; Huempfner, David F.; and Reich, Paul A., 3,613,606.

American Locker Company, Inc.: *See—*
Stackhouse, Wells F.; and Barth, Douglas A., 3,613,855.

American Packaging Corporation, The: *See—*
Watts, Ridley Jr., 3,614,383.

American Sign & Indicator Corporation: *See—*
Caferro, Edward M., 3,613,275.
American Standard, Inc.: *See—*
Loveley, Joseph D., 3,613,776.
AMF Incorporated: *See—*
Monte, Matthew Sallee, 3,613,693.
Amici, Francis Robert; and Bornn, Ralph, to Ideal Toy Corporation. Animated doll. 3,613,299, Cl. 46-120.
Amicone, Raymond George; Davey, Charles T.; and Dunning, Warren J., to Air Balance, Inc., mesne. Electrically and/or thermally actuated release link. 3,613,795, Cl. 169-42.
AMP Incorporated: *See—*
Gudaitis, Bernard Vincent; and Loose, Winfield Warren, 3,614,346.
Ampex Corporation: *See—*
Iwata, Akiyoshi, 3,614,333.
Siebert, Raymond C., 3,614,342.
Sorensen, Ronald Jon, 3,613,877.
Amsted Industries Incorporated: *See—*
Altherr, Russell G., 3,613,902.
Peck, Richard O., 3,614,053.
Anaconda Wire and Cable Company: *See—*
Kothe, Erich W.; and Laird, Andrew C., 3,614,289.
Plate, Walter J., 3,614,290.
Wilson, Floyd A., 3,614,300.
Ananiev, Lev Martemianovich; Pekker, Yakov Semenovich; Chakhlov, Vladimir Lukianovich; Sharachin, Yakov Afanasievich; Shtein, Mikhail Mikhailovich; and Yarushkin, Jury Pavlovich. Betatron. 3,614,638, Cl. 328-237.
Anantha, Narasipur G., to International Business Machines Corporation. Improved surface barrier transistor. 3,614,560, Cl. 317-235.
Anderson, Donald E., to Schjeldahl, G. T., Company. Method and apparatus for coating articles utilizing rotating crucible coating apparatus including a centrifugal-type crucible. 3,613,633, Cl. 118-5.
Anderson, Edgar F. Fishing device. 3,613,284, Cl. 43-26.1
Anderson, Gerald H.: *See—*
Ganci, Edward; Gance, Joseph V.; and Anderson, Gerald H.,3,614,133.
Anderson, Norman R.; and Rundle, David F., to Bunker-Ramo Corporation, The. Electrical connector having adjustable keying. 3,614,711, Cl. 339-90.
Anderson, Philip J. Method and system for static testing structures. 3,613,435, Cl. 73-37.
Anderson, Philip J., to Institute of Gas Technology. Low noise process for breaking pavement which relies upon reflected tensile pulses to fracture the pavement. 3,614,163, Cl. 299-14.
Anderson, Richard D.: *See—*
Whitman, Wesley H., Jr.; and Anderson, Richard D.,3,614,205.
Anderson, Roland Borg, to Bunker-Ramo Corporation, The. System for converting to a BCD code. 3,614,403, Cl. 235-155.
Ando, Sadanao, to Kabushiki Kaisha Ricoh. Device for cleaning developed electrostatic photographic copy sheet. 3,613,701, Cl. 134-64.
Andree, Harold C.: *See—*
Connolly, Walter L.; Andree, Harold C.; and Harrison, Ralph M.,3,614,250.
Andrew Engineering Company: *See—*
Dulebohn, David H., 3,614,372.
Andrews, Daniel E., Jr.; Klund, William E.; and Isaak, Robert D., to United States of America, Navy. Secure communication system. 3,614,316, Cl. 178-22.
Andrews, Laurence M.: *See—*
Apstein, Maurice; Blomgren, Evert; Keehn, George R.; Andrews, Laurence M.; and Rabinow, Jacob,3,613,589.
Andrews, Maurice. Device to be used when applying a cosmetic. 3,613,697, Cl. 132-79.
Anna, Otto; Kassner, Jochen; and Druen, Bernhard, to Braun Aktiengesellschaft. Electrically operated motion conversion means. 3,614,491, Cl. 310-37.
Antennacraft Company: *See—*
Ringland, Robert S., 3,614,628.
Anthony, Albert M., to Tracor, Inc. Convergence unit for color television picture tube. 3,614,688, Cl. 335-210.
Anti-Pollution, Inc.: *See—*
Cloutier, Charles C., 3,613,891.
Antler, Harry, to Lockheed Aircraft Corporation. Eye position indicator for mounting in a vehicle. 3,613,250, Cl. 33-63.
Antoun, Paul R.: *See—*
Morgan, Albert R., Jr.; Antoun, Paul R.; Callahan, Howard E.; and Maugel, Theodore R.,3,613,328.
Anza Pacific Corporation: *See—*
Keyston, David H., 3,614,049.
Aoki, Shigebumi: *See—*
Oyama, Yoshitoshi; Takashima, Yoichi; and Aoki, Shigebumi,3,613,989.
Apel, Konstantin. Regulator for a heater element. 3,614,392, Cl. 219-501.
Apel, Konstantin, to Holzer Patent AG. Voltage transformer. 3,614,535, Cl. 317-40.
Appleton Wire Works Corporation: *See—*
Lee, Charles A.; and Sorrells, Frank D., 3,613,639.
Applied Power Industries, Inc.: *See—*
Schultze, Eckart F.; and Schultz, John R., 3,614,267.
Apstein, Maurice; Blomgren, Evert; Keehn, George R.; Andrews, Laurence M.; and Rabinow, Jacob, to United States of America, Army. Bomb fuzing system. 3,613,589, Cl. 102-70.2
Aqua Matic, Inc.: *See—*
Whitlock, Robert A., 3,613,731.
Arai, Toshikatsu, to Tomy Kogyo Co., Ltd. Toy airplane and trackway. 3,613,306, Cl. 46-216.
Arakawa, Kazuyuki, to Tsudakoma Industrial Co., Ltd. Gear transmission mechanism of a weaving loom. 3,613,470, Cl. 74-393.
Archer, Fred Curtis; Dediemar, Ronald B.; and Schuman, LeRoy J., to Barber-Greene Company. Gyratory crusher. 3,614,023, Cl. 241-202.
Archer, Robert L. Apparatus for orienting beam directing or viewing apparatus. 3,613,464, Cl. 74-89.15
Arcoa, Incorporated: *See—*
Ryden, James W.; and Abromavage, John C., 3,613,921.
Arctic Enterprises, Inc.: *See—*
Hetteen, Edgar E., 3,613,812.
Arkla Industries, Inc.: *See—*
Bawel, Fred W., 3,613,390.
Arndt, Charles J., to Harsco Corporation. Power conductor take-up system. 3,613,866, Cl. 198-139.
Arnold, Bruce C.: *See—*
Mc Roberts, Richard C.; and Arnold, Bruce C.,3,613,469.
Arnold, Ronald J. K.: *See—*
Watkin, Brian L. H.; Evans, Norman; and Arnold, Ronald J. K.,3,614,408.
Aron, Milton A.: *See—*
Moore, Edward H.; and Aron, Milton A.,3,614,759.
Arpax Company, The: *See—*
Johnson, George R., 3,613,522.
Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Matsumoto, Tohru; and Kazamaki, Tomokazu, 3,614,208.
Mita, Kunio; and Umemura, Yukio, 3,613,543.
Asano, Tadao; Yamaguchi, Hiroji; and Ishikawa, Kazuo, to Aisin Seiki Kabushiki Kaisha. Forward-reverse and brake control valve. 3,613,844, Cl. 192-4.
Ashtabula Bow Socket Company: *See—*
Allds, Raymond J., 3,613,203.
Ashworth, Donald T. Bicycle parachute. 3,614,132, Cl. 280-289.
Aslund, Nils Robert Dahr, to SAAB Aktiebolag. Device for linear displacement of a plane optical image in its own plane. 3,614,233, Cl. 356-83.
Associated Electrical Industries Limited: *See—*
Openshaw, Ian K., 3,614,424.
Ateliers de Constructions Mecaniques de Vevey S.A.: *See—*
Merenda, Adrien, 3,614,268.
Atkinson, Cyril Millward: *See—*
Ainsworth, David; and Atkinson, Cyril Millward,3,613,742.
Atkinson, Cyril M., to Northrop Weaving Machine Limited. Loom let-off and take-up mechanisms. 3,613,739, Cl. 139-1.
Atlanta Stove Works, Inc.: *See—*
Wilkinson, Judkins E., 3,613,660.
Atlantic Bridge Company Limited: *See—*
Patterson, William C., 3,614,167.
Atlantic Richfield Company: *See—*
Dunlap, Henry F.; and Wilson, Robert, 3,613,378.
Atlas Copco Aktiebolag: *See—*
Jonsson, Nils Gunnar, 3,613,804.
Atwood Vacuum Machine Company: *See—*
Marx, Thomas O., 3,614,146.
Aubin, Jean-Paul R.: *See—*
Snyder, Warren E.; Cavanaugh, John B.; and Aubin, Jean-Paul R.,3,613,651.
Aufill, Charles B.: *See—*
Hightower, Russell D.; and Aufill, Charles B.,3,613,455.
Aulen, Walter E., to Eddystone Machinery Company. Cloth winder having cutter and pressure bar. 3,614,010, Cl. 242-56.
Austron, Inc.: *See—*
Cosman, Armond D.; and Snider, Albert L., 3,614,485.
Auten, Robert D.: *See—*
Schleicher, Thomas R.; and Auten, Robert D.,3,613,899.
'Automatic' Sprinkler Corporation of America:*See—*
Hedrick, Robert R.; and Thomas, Arthur L., 3,613,863.
Sarno, Richard L., 3,614,099.
Automation International, Inc.: *See—*
Davis, Henry J., 3,613,332.
Automobiles Peugeot: *See—*
Drevard, Michel; Mognetti, Charles; and Vermot, Andre, 3,613,396.
Froumajou, Armand, 3,613,645.
Autorol Corporation: *See—*
Prosser, David G., 3,613,518.
Avco Corporation: *See—*
Bench, Thomas E.; and Coffenberry, James H., 3,613,580.
Spada, Albert J., 3,613,907.
Weller, Carroll E.; and McNair, Robert J., 3,614,665.
Avins, Jack, to RCA Corporation. Shielded semiconductor device. 3,614,546, Cl. 317-234.
Avions Marcel Dassault: *See—*
Labussiere, Andre, 3,613,827.
AVM Corporation: *See—*
Johnson, Jesse R., 3,613,513.

Awano, Taikichi; and Oishi, Yoshihiro, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Liquid metal forging process. 3,613,768, Cl. 164-120.
Aycock, William C.: *See—*
Schwarz, William W.; Flanigan, David A.; and Aycock, William C.,3,613,434.
Babbage, William C., to Rocform Corporation. Tie-rod seal for prefabricated wall forms. 3,614,052, Cl. 249-43.
Bailey, Knight V.; and Hattaway, Dudley P., to United States of America, Navy. Image rectifier. 3,614,410, Cl. 235-186.
Bainard, Dean R.: *See—*
Berens, Alfred S.; Bainard, Dean R.; and Corsi, George L.,3,614,183.
Baker, Charles E.: *See—*
Fournier, Gerald R.; and Baker, Charles E.,3,614,312.
Baker, J. E., Company, The: *See—*
Small, Kenneth R.; and Small, John F., 3,613,453.
Baker, James L.: *See—*
Blomgren, Evert; and Baker, James L.,3,613,595.
Baker, Jesse Wade. Cutting rod. 3,613,243, Cl. 30-314.
Baker Perkins Inc.: *See—*
Loomans, Bernard A.; and Todd, David B., 3,613,160.
Loomans, Bernard A., 3,614,070.
Baker, Theodore C.; Bode, Wolfgang W.; Mathias, Richard G.; Nolan, James F.; and Pfaender, Lawrence V., to Owens-Illinois, Inc. Gas discharge display memory device. 3,614,511, Cl. 313-220.
Bakery Specialty Machinery Co.: *See—*
Reisman, Howard, 3,613,603.
Balch, William: *See—*
Fitzpatrick, Richard; Fitzpatrick, Richard D.; and Balch, William,3,613,251.
Baldauf, Richard K.: *See—*
Leibowitz, Lawrence M.; and Baldauf, Richard K.,3,614,632.
Baldwin, D. H. Company: *See—*
Brean, John W., 3,614,775.
Ballinger, J. R., to All-O-Matic Manufacturing Corporation. Pressure-vacuum control valve. 3,613,718, Cl. 137-493.
Baltensperger, Paul, to Aktiengesellschaft Brown, Boveri & Cie. Arrangement for damping electrical oscillations on a high voltage alternating current transmission line. 3,614,530, Cl. 317-11.
Band, Ian T.; and Borden, Howard C., to Hewlett-Packard Company. Display apparatus. 3,614,771, Cl. 340-336.
Bank, Henning; Jilsen, Per-Owe; Klein, Hans; and Persson, Tage, to Allmanna Svenska Elektriska Aktiebolaget. Winding coil support means. 3,614,498, Cl. 310-262.
Barber-Greene Company: *See—*
Archer, Fred Curtis; Dediemar, Ronald B.; and Schuman, LeRoy J., 3,614,023.
Bard, Martin. Shelf mounting with locking slider. 3,614,044, Cl. 248-243.
Barker, Loren B., to Lear Siegler, Inc. Feeder and stacker. 3,613,886, Cl. 209-125.
Barratt, Robert O., to Foster Wheeler Corporation. Combined once-through and natural circulation vapor generator. 3,613,643, Cl. 122-34.
Barratt, Robert O., to Foster Wheeler Corporation. Bayonet tube bank vapor generator. 3,613,781, Cl. 165-145.
Barth, Douglas A.: *See—*
Stackhouse, Wells F.; and Barth, Douglas A.,3,613,855.
Bartley, William H.: *See—*
Hinerfeld, Norman M.; Noble, David S.; and Bartley, William H.,3,613,608.
Hinerfeld, Norman M.; Noble, David S.; and Bartley, William H.,3,613,610.
Barto, Robert: *See—*
Van Auken, John A.; Rush, Christopher; Blank, Fritz A.; Hoffman, Lionel; and Barto, Robert,3,614,089.
Basista, Heinrich, to Zeiss-Stiftung, Carl, d/b/a Zeiss, Carl. Photographic objective with continuously variable focal length. 3,614,207, Cl. 350-184.
Bass, Alvin S.: *See—*
Laidman, Robert, 3,613,987.
Bass, Joseph A.: *See—*
Cofer, Daniel B.; and Bass, Joseph A.,3,613,767.
Bass, Michael: *See—*
Monchamp, Roch R.; Weber, Marvin J.; and Bass, Michael,3,614,662.
Bassani, Peppino. Seismic borehole plug. 3,613,784, Cl. 166-187.
Basset, James. Method and means providing buoyancy of immersed crafts and crafts incorporating such means. 3,613,616, Cl. 114-16.5
Bassett, Clarence R. Carton opener tool. 3,613,134, Cl. 7-14.1
Baudet, Jean Pierre: *See—*
Moriceau, Pierre; and Baudet, Jean Pierre,3,614,134.
Bauer, Friedrich, to Hoerbiger Ventilwerke Aktiengesellschaft. Compressor valve arrangement. 3,613,719, Cl. 137-522.
Baumgartl, Paul, to Ford Motor Company. Transmission ratio control linkage mechanism. 3,613,474, Cl. 74-484.
Bausch & Lomb Incorporated: *See—*
Letter, Eugene C., 3,614,202.
Letter, Eugene C., 3,614,203.
Letter, Eugene C., 3,614,211.
Vollmer, David W., 3,614,195.
Bawel, Fred W., to Arkla Industries, Inc. Control circuits for absorption refrigeration machine. 3,613,390, Cl. 62-148.
Baxter Laboratories, Inc.: *See—*
Giambrone, Harry Joseph, 3,613,172.
Bayne, Peter D., to Schlitz, Jos. Brewing Company. Dispensing apparatus. 3,613,954, Cl. 222-61.
Baynes, William R.; and Kaminski, Stephen H., to Mattel, Inc. Independent suspension for toy vehicles. 3,613,307, Cl. 46-221.
Be Vier, William E.; and Wagner, Rolf E., to Mechanical Technology Incorporated. Pulse counter having selectable whole and fractional number division. 3,614,631, Cl. 328-48.
Beach, David E., to Eastman Kodak Company. Gear drive for a camera and film cartridge. 3,613,541, Cl. 95-31.
Beach, David E., to Sylvania Electric Products, Inc., mesne. Percussion activatable flash units having individual striker elements. 3,614,413, Cl. 240-1.3
Beard, Lloyd R.; Mc Naghten, Delmar E.; and Popeck, Charles A., to Chance, A. B., Company. On-the -line distribution cutout switch. 3,614,700, Cl. 337-203.
Beard, Walter C., to Aerosol Systems Inc., mesne. Refillable aerosol container. 3,613,960, Cl. 222-330.
Beasley, Robert W., to Nelson, Ted, Company. Form for portable concrete building module. 3,614,054, Cl. 249-179.
Beck, Charlotte, to Beck, Waller, KG Kontroll-und Fernmessgerate. Blood-pressure measuring device with pulse-rate timer. 3,613,667, Cl. 128-2.05
Beck, Charlotte; Roll, Karl; and Kummer, Fritz, to Beck, Walter, KG Kontroll und Fernmessgerate. Sphygmomandometer with built -in timer. 3,613,668, Cl. 128-2.05
Beck, Christian A.; and Tomasch, Franz A., to Pitney-Bowes, Inc. Separator for juxtaposed sheets. 3,614,095, Cl. 271-64.
Beck, John J.; and Gilkey, George M., to Gulf & Western Systems Company. Distributor rotor contact blade member. 3,614,359, Cl. 200-166.
Beck, Waller, KG Kontroll-und Fernmessgerate: *See—*
Beck, Charlotte, 3,613,667.
Beck, Walter, KG Kontroll und Fernmessgerate: *See—*
Beck, Charlotte; Roll, Karl; and Kummer, Fritz, 3,613,668.
Becker, Karl V.: *See—*
Pelletier, Raymond T.; and Becker, Karl V.,3,613,138.
Becker, Otto Alfred. Welding of sheet metal coated with layers. 3,614,375, Cl. 219-91.
Bedocs, Michael F., to Cherry Electrical Products Corporation. Anti-wobble actuator for an electric switch. 3,614,364, Cl. 200-172.
Beehler, Vernon D.: *See—*
Sawyer, Harold T., 3,613,141.
Beelik, Victor, Jr.; and Rosenblatt, Jerome J., to Hughes Aircraft Company. Infrared aligning apparatus and method. 3,614,439, Cl. 250-83.3
Beer, Palle-Finn, to AGA Aktiebolag. Bearing arrangement for a rotor. 3,614,180, Cl. 308-10.
Behn, Reinhard; Hoyler, Gerhard; and Kessler, Hartmut, to Siemens Aktiengesellschaft. Electrical condenser. 3,614,561, Cl. 317-258.
Behr, Michael I.; Blessum, Norman S.; and Wang, James T., to Burroughs Corporation. Method and apparatus for saturation type digital magnetic recording. 3,614,758, Cl. 340-174.1
Behr, Raymond D.; Friebe, Edward A.; and Brandow, Earl E., to Dow Chemical Company, The. Method and apparatus for manufacturing bag stock. 3,613,524, Cl. 93-33.
Behrens, C., Aktiengesellschaft: *See—*
Bredow, Walter, 3,613,490.
Beike, Hans. Method and apparatus for pulverizing materials. 3,614,001, Cl. 241-23.
Beiser, Leo, to Columbia Broadcasting Systems, Inc. Light scanning system utilizing diffraction optics. 3,614,193, Cl. 350-7.
Belfor, Myer D. Picture frame construction. 3,613,279, Cl. 40-152.
Bell & Howell Company: *See—*
Carlson, Richard K., 3,614,219.
Davidson, Richard M., 3,614,021.
Henriksen, Elmer C., 3,614,022.
Bell, Robert P.: *See—*
Mottern, John W.; Cunningham, Robert E.; and Bell, Robert P.,3,613,158.
Bell Telephone Laboratories, Incorporated: *See—*
Benowitz, Paul; and Kahlbrock, Heinz, 3,614,317.
Berglund, Carl N.; and Lepselter, Martin P., 3,614,480.
Biazzo, Martin R.; King, Bernard G.; and Ortel, William C. G., 3,614,201.
Brown, William S., 3,614,406.
Buzzard, Clair Alan, 3,614,324.
Glinski, Vincent J., 3,614,555.
Gronros, Warren; and Walsh, Edward J., 3,614,654.
Heightley, John D., 3,614,469.
Javan, Ali; Bennett, William R., Jr.; and Herriott, Donald R., 3,614,653.
Martin, Raymond J.; and Ulrich, Reinhard, 3,614,198.
Paoli, Thomas L.; and Ripper, Jose E., 3,614,447.
Pinnow, Douglas A.; and Williamson, Samuel R., 3,614,204.
Rigrod, William W., 3,614,659.
Seidel, Harold,, 3,614,647.
Bellows, Alfred H., to Polaroid Corporation. Photoflash lamp assembly. 3,614,412, Cl. 240-1.3
Belman, Harris J., to International Business Machines Corporation. FSK digital demodulator with majority decision filtering. 3,614,639, Cl. 329-104.

Beloit Corporation: *See—*
Karr, Gerald W., 3,614,011.

Belopolsky, Anatoly Ovseevich; Evdokimov, Jury Pavlovich; Vexelman, Garald Lvovich; Nikolsky, Gennady Georgievich; and Pchelin, Vitaly Pavlovich. Apparatus for contacting gases with granular solid materials. 3,613,256, Cl. 34-57.

Beltx Corporation: *See—*
De Woskin, Irvin S., 3,613,686.

Bench, Thomas E.; and Coffenberry, James H., to Avco Corporation. Wedge-shaped free fall device. 3,613,580, Cl. 102-4.

Bendix Corporation, The: *See—*
Boenke, Clyde A., 3,614,441.
Branson, Orland D., 3,614,173.
Cutler, Hymie, 3,614,575.
Honeywell, Charles C.; and Voige, Louis H., 3,614,577.
Kytta, Oswald O., 3,613,506.
Liebman, Henry F., 3,614,477.
Macduff, Stanley I., 3,613,839.
Rossire, Francis Henry Sand, 3,614,314.
Scott, Richey L., 3,613,451.
Troeger, Henry, 3,613,850.

Bendler, Hellmut: *See—*
Gawlick, Heinz; Marondel, Gunther; Bendler, Hellmut; and Siegelin, Werner,3,613,758.

Benjamin, Fred. Voltage and wattage indicator for arc lamps. 3,614,611, Cl. 324-142.

Benjamin, Jack W. Grooming aid. 3,613,694, Cl. 132-45.

Bennett, William R., Jr.: *See—*
Javan, Ali; Bennett, William R., Jr.; and Herriott, Donald R.,3,614,653.

Bennett, Winton J. Stabilizing jack structure for mobile vehicle. 3,614,064, Cl. 254-86.

Benowitz, Paul; and Kahlbrock, Heinz, to Bell Telephone Laboratories, Incorporated. Three-state frequency shift signal receiver. 3,614,317, Cl. 178-66.

Benson, Carl Ivar, Jr.; and Rapoza, James, to Paragon Gears, Incorporated. Forward-reverse selector with starter switch. 3,613,482, Cl. 74-850.

Benson, James M.; and Easter, Edmond, to Teledyne, Inc. Fluid flow measuring apparatus. 3,613,448, Cl. 73-205.

Bentley, Thomas P.; and Miller, Donald F., to Du Pont de Nemours, E. I., and Company. Apparatus for jetting liquid onto fibrous material. 3,613,999, Cl. 239-553.3

Berens, Alfred S.; Bainard, Dean R.; and Corsi, George L., to Federal-Mogul Corporation. Shaft seal with expandable outer periphery. 3,614,183, Cl. 308-187.1

Berg Electronics, Inc.: *See—*
Landman, Dirk; and Pinger, Edmund G., 3,613,213.

Berglund, Carl N.; and Lepselter, Martin P., to Bell Telephone Laboratories, Incorporated. Temperature stabilized electronic device. 3,614,480, Cl. 307-299.

Berglund, Malcolm F. Stair truck. 3,614,115, Cl. 280-5.32

Berkey/Colortran Mfg., Inc.: *See—*
Glickman, Richard B., 3,614,710.

Berkley & Company, Inc.: *See—*
Grein, Thomas E., 3,613,287.

Berkmuller, Otto. Container for the storage and delivery of a fluid or pasty material. 3,613,963, Cl. 222-389.

Berler, Robert M., to Pitney Bowes-Alpex, Inc. Fluorescent ink imprinted coded document and method and apparatus for use in connection therewith. 3,614,430, Cl. 250-71.

Berlincourt, Don A., to Clevite Corporation. Width flexural resonator and coupled mode filter. 3,614,483, Cl. 310-8.1

Bernardis, Francesco, to Olivetti, Ing., C., & C., S.p.A. Document feeding device. 3,614,091, Cl. 271-52.

Bertin & Cie: *See—*
Cabassut, Andre Emile Roger, 3,613,826.

Betts, Max William: *See—*
Jeffcoat, Keith; and Betts, Max William,3,613,401.

Betz, Edward R.: *See—*
Rieman, Willis E.; and Betz, Edward R.,3,614,573.

Betz, George J. Combination spare wheel holder and step for pickup trucks. 3,613,971, Cl. 224-42.01

Bi-Flex Birkenstock KG: *See—*
Kneusels, Rudolf, 3,613,145.

Biazzo, Martin R.; King, Bernard G.; and Ortel, William C. G., to Bell Telephone Laboratories, Incorporated. Acoustically absorbent mounting method and apparatus for optical modulator. 3,614,201, Cl. 350-160.

Biddle, Raymond G. Wheelchairs. 3,613,813, Cl. 180-6.5

Biegler, Hanns, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Apparatus for coating extruded plastic tubes with finely divided silica or silicates. 3,613,159, Cl. 18-14.

Bielsten, Nils Ove, to Allmanna Svenska Elektriska Aktiebolaget. Magneto-elastic transducer for lateral force. 3,613,442, Cl. 73-141.

Bieri, Hans, to Erik Olsson AG. Open-ended mold casting apparatus. 3,613,771, Cl. 164-282.

Biet, Jean: *See—*
Leblond, Jean; and Biet, Jean,3,613,903.

Bifasiewicz, Tadeusz M.: *See—*
Adair, James Richard; and Bifasiewicz, Tadeusz M.,3,613,426.

Big Ben Scaffolding Limited: *See—*
Dunster, Frederick H., 3,613,832.

Bigbee, John H., III: *See—*
Burkett, Wilford B.; and Bigbee, John H., III,3,614,582.
Burkett, Wilford B.; and Bigbee, John H., III,3,614,584.

Bijou, Patricia W. Elastic bandage with tension indicator. 3,613,679, Cl. 128-169.

Bilello, Michael J.: *See—*
Rehse, Denis O.; Brooks, Alfred P.; and Bilello, Michael J.,3,613,885.

Bilger, Hans Rudolf: *See—*
Nicolet, Marc-Aurele; and Bilger, Hans Rudolf,3,614,679.

Bindshelder, Theodore S., to Burroughs Corporation. Data-records, and data-recording and utilizing methods and means. 3,614,394, Cl. 235-61.9

Bio-Dynamics Inc.: *See—*
Allen, Derek P., 3,613,241.

Birger, Boris Lvovich: *See—*
Folivorov, Vladimir Kikhailovich; Ukraintsev, Boris Nikolaevich; Sirotenko, Georgievich; Tinte, Aivar Eduardovich; Birger, Boris Lvovich; Vilnitis, Aivar Yanovich; Nadezhnikov, Nikita Mikhailovich; and Grinshteen, Mark Ilich,3,614,080.

Bishop, Robert James: *See—*
Meylink, John Gary; and Bishop, Robert James,3,613,815.

Bissett-Berman Corporation, The: *See—*
Roese, Robert, 3,614,545.

Black and Decker Manufacturing Company, The: *See—*
Furtaw, Clayton C., 3,613,338.

Blackburn, Marvin J.; and Criner, Harry E., to Vernon Tool Company. Universal pipe cutting and handling machine. 3,614,077, Cl. 266-23.

Blaiklock, Paul M., to Foxboro Company, The. Electric to fluidic signal transducer. 3,613,709, Cl. 137-81.5

Blake, Bernard S., Jr. Digital instrumentation system for motor vehicles. 3,614,617, Cl. 324-166.

Blank, Fritz A.: *See—*
Van Auken, John A.; Rush, Christopher; Blank, Fritz A.; Hoffman, Lionel; and Barto, Robert,3,614,089.

Blasko, Joseph, to Abbott Laboratories, mesne. Portable resuscitator. 3,613,677, Cl. 128-145.6

Blatt, Leland F. Vacuum holder and control assembly. 3,613,904, Cl. 214-1.

Blessing-Werke KG: *See—*
Reinbold, Otto Horst, 3,613,349.

Blessum, Norman S.: *See—*
Behr, Michael I.; Blessum, Norman S.; and Wang, James T.,3,614,758.

Blickman, Harry, to Blickman, S., Inc. Weight lifting exercising apparatus. 3,614,097, Cl. 272-72.

Blickman, S., Inc.: *See—*
Blickman, Harry, 3,614,097.

Bliss, Frank E., Jr., to Sanders Associates, Inc. Unilateral heat transfer apparatus. 3,613,774, Cl. 165-32.

Block, Fred G.: *See—*
Hall, William B.; and Block, Fred G.,3,613,773.

Blomgren, Evert: *See—*
Apstein, Maurice; Blomgren, Evert; Keehn, George R.; Andrews, Laurence M.; and Rabinow, Jacob,3,613,589.

Blomgren, Evert; and Baker, James L., to United States of America, Army. Tail fuze. 3,613,595, Cl. 102-83.

Blomstrand, John H.; and Nyquist, Frederick W. Wire connector with frusto-conical gripping spring. 3,614,296, Cl. 174-87.

Blount, George W. Hinged cover construction for a water closet. 3,613,129, Cl. 4-236.

Bloxsom, Dan E. Apparatus for stretching thermoplastic. 3,613,155, Cl. 18-1.

Blythe, George E. K. Method for the comminution of particulate solid materials. 3,614,000, Cl. 241-5.

Bode, Wolfgang W.: *See—*
Baker, Theodore C.; Bode, Wolfgang W.; Mathias, Richard G.; Nolan, James F.; and Pfaender, Lawrence V.,3,614,511.

Bodge, Philip K. Fluid mass flowmeter. 3,613,450, Cl. 73-231.

Bodine, Albert G. Sonic soil tiller and rock reducer. 3,613,799, Cl. 172-40.

Boeckeler, Benjamin Clark: *See—*
Nemeth, Bela J.; and Boeckeler, Benjamin Clark,3,613,164.

Boeing Company, The: *See—*
Curry, Truman M., 3,613,443.
Kennedy, Paul B., 3,613,627.
Krauss, Hans G., 3,613,504.
Romero, Ervin G., 3,614,174.
Vdolek, Alexander V., 3,614,037.

Boelke, Gilbert L., to Sylvania Electric Products, Inc. Broadband impedance matching transformer. 3,614,676, Cl. 333-26.

Boenke, Clyde A., to Bendix Corporation, The. Infrared radiation detection circuitry having a constant bias voltage a cross the sensor. 3,614,441, Cl. 250-83.3

Boersma, Rintje, to N.V. COQ. SF_6 system with constant density and constant pressure differential maintaining means for a high- voltage switchgear. 3,614,355, Cl. 200-148.

Boersma, Rintje; and Irik, Gijsbert W., to N.V. 'COQ'-Utrecht. Electric contact devices. 3,614,717, Cl. 339-262.

Bogels, Peter Willibrord. Air bearing head drum with grooves to generate the air layer. 3,614,338, Cl. 179-100.2

Boise Cascade Corporation: *See—*
McCulloch, Roger L., 3,613,956.

Bolger, Bouwe, to U.S. Philips Corporation. Optical maser modulator using interference between two portions of the output beam. 3,614,655, Cl. 331-94.5

Bonch-Bruevich, Andrei Mikhailovich: *See—*
Yalyshev, Aly Umyarocivh; Svecharnik, David Veniaminovich; Pavlenko, Vladimir Alexandrovich; Tsarkov, Vyacheslav Alexeevich; Bonch-Bruevich, Andrei Mikhailovich; and Levinson, Boris Alexandrovich,3,614,633.

Bond, James M. Apparatus facilitating care of a bedfast patient. 3,613,127, Cl. 4-185.

Bonvallet, Duane J., to United States of America, Army. Telephone monitor. 3,614,334, Cl. 179-107.

Bookout, Floyd V.: *See—*
Rockola, Donald C.; and Bookout, Floyd V.,3,613,945.

Boone, Frank L. Dispensing container for flowable pasty material and the like. 3,613,962, Cl. 222-389.

Borchers, Alwin; Sjotun, Kyrre Guttorm; Hansen, Gunnar Lyshoj; and Clausen, Jorgen Rono, to Danfoss A/S. Single-phase electric motor. 3,614,494, Cl. 310-126.

Borden, Howard C.: *See—*
Band, Ian T.; and Borden, Howard C.,3,614,771.

Boris Kroll Jacquard Looms, Inc.: *See—*
Ravella, Arthur, 3,613,741.

Born Engineering Company: *See—*
Born, Sidney, 3,614,073.

Born, Sidney, to Born Engineering Company. Fired heater construction. 3,614,073, Cl. 263-20.

Borneman, Karl J., to Ford Motor Company. Hydrokinetic transmission and accessory drive. 3,613,479, Cl. 74-688.

Borner, Manfred; and Goldbach, Gunter, to Telefunken Patentverwertungsgesellschaft m.b.H. Semiconductor laser diode arrangement for exciting light-wave conductors. 3,614,661, Cl. 331-94.5

Bornn, Ralph: *See—*
Amici, Francis Robert; and Bornn, Ralph,3,613,299.

Borrok, Martin J.; Perkinson, Robert E.; Watson, Fred D.; and Von Fange, Wilbur H., to Mc Donnell Douglas Corporation. Indicator means for collision avoidance systems. 3,614,728, Cl. 340-23.

Bosch, Robert, G.m.b.H.: *See—*
Flaschar, Heinz; Weigert, Wilhelm; Werner, Walter; and Kramer, Manfred, 3,613,509.
Franke, Horst; and Dobler, Erich, 3,614,270.
Hamisch, Hansjoachim, 3,614,456.
Hoheisel, Rainer; Fischer, Berthold; and Ackermann, Gunter, 3,613,716.
Krauss, Rudolf, 3,613,998.
Paule, Kurt; Schadlich, Fritz; and Hettich, Alfred, 3,613,696.
Stumpp, Gerhard; and Peters, Klaus-Jurgen, 3,613,650.

Bosnak, John J.: *See—*
Joslow, David L.; and Bosnak, John J.,3,614,322.

Bottas, Michael J.; Difley, Charles R.; and Miller, Frank E., to Whirlpool Corporation. Refuse compactor ram cover. 3,613,568, Cl. 100-229.

Bottas, Michael J.; MacFarlane, Thomas R.; and Miller, Frank E., to Whirlpool Corporation. Refuse compactor. 3,613,560, Cl. 100-52.

Bouis, Hugues: *See—*
Chatelain, Roger; and Bouis, Hugues,3,613,974.

Bourns, Inc.: *See—*
Froebe, Ronald L., 3,614,703.

Bowe, Bohler & Weber KG, firma: *See—*
Fuhring, Heinrich; and Sieber, Johannes Helmut, 3,613,135.

Bowen, Howard: *See—*
Grunwald, Robert F.; Wallace, Richard R.; and Bowen, Howard,3,613,444.

Bowen Tools, Inc.: *See—*
Slator, Damon T.; and Wilson, Archie, 3,614,019.

Bowles Fluidics Corporation: *See—*
Colston, John R., 3,613,369.
Range, Richard J., 3,614,168.

Bowman, Raymond D., to Seeburg Corporation, The. Check controlled vend relay timing circuit. 3,613,854, Cl. 194-10.

Bowrns, Inc.: *See—*
Hluchan, Stpehen A.; Herman, Sidney; and Dowd, Eugene G., 3,614,731.

Boyd, A C., to Fi-Shock, Inc. Electric fence controller. 3,614,293, Cl. 174-52.

Bozoian, Michael, to Ford Motor Company. Electronic circuitry for vehicle speed responsive system. 3,613,820, Cl. 180-105.

Bozoian, Michael, to Ford Motor Company. Engine coolant level waring system. 3,614,730, Cl. 340-59.

Bracker AG: *See—*
Ramseier, Paul, 3,613,981.

Bradbury, Bernard, to Rex Chainbelt Inc. Luggage carrier unloader. 3,613,916, Cl. 214-62.

Bradley, Chester D.; and Tate, Malcolm C., to Emery, A. H., Company, The. Tension load cell. 3,613,517, Cl. 92-98.

Brandli, Ronald I.; Klema, Lawrence E.; and Reese, Garald D., to Textron Inc. Tracked vehicle suspension system. 3,613,811, Cl. 180-5.

Brandow, Earl E.: *See—*
Behr, Raymond D.; Friebe, Edward A.; and Brandow, Earl E.,3,613,524.

Brandts, Conrad W.; Stemple, Eugene P.; and Frazer, Richard A., to United States of America, Navy. Optical target position indicator. 3,614,240, Cl. 356-152.

Branson Instruments, Incorporated: *See—*
Shoh, Andrew, 3,614,484.

Branson, Orland D., to Bendix Corporation, The. Slip command skid control. 3,614,173, Cl. 303-21.

Braun Aktiengesellschaft: *See—*
Anna, Otto; Kassner, Jochen; and Druen, Bernhard, 3,614,491.

Bray, Warren E., 75% to Warner, Richard E. Welding rod. 3,614,380, Cl. 219-146.

Brean, John W., to Baldwin, D. H. Company. Optical encoder with pnpn diodi sensing. 3,614,775, Cl. 340-347.

Brechtel, Arthur: *See—*
Moos, Franz; Loffler, Gerhard; and Brechtel, Arthur,3,614,092.

Bredow, Walter, to Behrens, C., Aktiengesellschaft. Punching presses. 3,613,490, Cl. 83-132.

Breeden, Robert H., to Sperry Rand Corporation. Power transmission. 3,613,730, Cl. 137-625.6

Brehm, Hans, to Freudenberg, Carl. Apparatus for the spot application of adhesives to continuous sheet material. 3,613,635, Cl. 118-406.

Bremshey & Co.: *See—*
Weber, Heinz, 3,613,702.

Brennan, Francis P. Cap locking means for wardrobe hanger bar. 3,613,898, Cl. 211-124.

Brenner, William C., to Westinghouse Electric Corporation. Transposed conductor for dynamoelectric machines. 3,614,497, Cl. 310-213.

Brewer, John C., to Garbalizer Corporation of America. Processing of automobile bodies into scrap. 3,613,562, Cl. 100-74.

Breyer, Paul: *See—*
Porsche, Ferdinand Anton Ernst; and Breyer, Paul,3,613,644.

Bricknell, William H., to Hawker Siddeley Canada Ltd. Grapple attachment for tree processors. 3,613,750, Cl. 144-3.

Bridenstine, Orville J., to Phillips Petroleum Company. Nesting and stacking container. 3,613,943, Cl. 220-97.

Bridgestone Liquefied Gas Company: *See—*
Yamamoto, Katsuro, 3,613,932.

Bridgestone Tire Company Limited: *See—*
Kuwabara, Masayoshi, 3,613,736.

Briggs & Stratton Corporation: *See—*
Peifer, Charles Robert, 3,613,648.

British Iron and Steel Research Association, The: *See—*
Townsend, Nicholas A.; and Oxlade, Roy R., 3,613,428.

British Petroleum Company Limited, The: *See—*
Hyde, John W.; and George, William J., 3,613,792.
Watkin, Brian L. H.; Evans, Norman; and Arnold, Ronald J. K., 3,614,408.
Watkin, Brian Leslie, 3,614,409.

Britton, Sylvester C.: *See—*
Warren, Francis A.; and Britton, Sylvester C.,3,613,597.

Broad, Michael John: *See—*
Moss, Norman; and Broad, Michael John,3,613,649.

Broadhill Development Corporation: *See—*
Carlson, Elmer T., 3,614,297.

Brock, James D., to CMI Corporation. Asphalt plant dryer-mixer. 3,614,071, Cl. 259-147.

Brodie, James H. Hydraulic flow inducer. 3,614,072, Cl. 261-36.

Brodsky, Robert S. Pocket alarm dosimeter. 3,614,442, Cl. 250-83.6

Broken Hill Associated Smelters Proprietary Limited, The: *See—*
Stocks, Leon; and Castle, John Frederick, 3,614,081.

Bronne, William B.: *See—*
Linthicum Harley E.; and Bronne, William B.,3,613,853.

Bronstein, Leonard. Fused concentric trifocal corneal contact lens. 3,614,217, Cl. 351-161.

Bronstein, Leonard. Fused eccentric trifocal corneal contact len. 3,614,218, Cl. 351-161.

Brooks, Alfred P.: *See—*
Rehse, Denis O.; Brooks, Alfred P.; and Bilello, Michael J.,3,613,885.

Broughton, Douglas J.: *See—*
Collings, Dana B.; and Broughton, Douglas J.,3,613,759.

Brown, Clinton E., to United States America, Interior. Apparatus for obtaining high transfer rates in falling water film evaporators and condensers. 3,613,779, Cl. 165-133.

Brown, Clyde O.: *See—*
Pinsley, Edward A.; and Brown, Clyde O.,3,614,656.

Brown Company: *See—*
Colgren, Theodore; and Kane, Morris W., 3,613,437.

Brown, Gaylord W.: *See—*
Russell, Edward J.; Brown, Gaylord W.; and Dorman, Dennis J.,3,613,571.

Brown, James L., to Collins Radio Company. Failsafe and/monitor circuit. 3,614,591, Cl. 321-16.

Brown Machine Company of Michigan, Inc.: *See—*
Russell, Edward J.; Brown, Gaylord W.; and Dorman, Dennis J., 3,613,571.

Brown, Richard L. Resiliently-compressible spring mechanism. 3,614,084, Cl. 267-153.

Brown, William J.; Butler, Robert F.; Hedden, Smith E.; and Jablovskis, Janis, to United States of America, Navy. Electronic delay cartridge. 3,613,592, Cl. 102-70.2

Brown, William L.; and Portlock, John M., to United States of America, Atomic Energy Commission. Detection system. 3,614,724, Cl. 340o16.

Brown, William S., to Bell Telephone Laboratories, Incorporated. Machine processing of algebraic information. 3,614,406, Cl. 235-168.

Browning, Iben. Digital readout method and apparatus. 3,614,768, Cl. 340-325.

Brueschke, Erich E., to United States of America, Air Force. Multichannel multiplexed quasi three-dimensional display system. 3,614,521, Cl. 315-22.

Bruner, James D.: *See—*
Richter, Albert P., Jr.; and Bruner, James D.,3,614,726.

Brunner, Hans A., to Reynolds Metals Company. Apparatus for and method of testing and blocking strip conductor coils. 3,614,613, Cl. 324-158.

Bruschetti, Sergio; and Zummo, Ennio. Liquid metal heat exchangers with pressure absorbing means. 3,613,780, Cl. 165-134.

Bubula, Thomas J., to Caterpillar Tractor Company. Fluidic motion limiting system for motor driven apparatus. 3,613,505, Cl. 91-35.

Bucek, Jiri B.; and Shultz, James R., to Fincor, Inc. Bi-directional A.C. tachometer. 3,614,616, Cl. 324-165.

Buchholtz, Charles M.: *See—*
Post, Gerald; Buchholtz, Charles M.; and Rattin, Luciano,3,614,222.

Buciak, Peter. Hydraulic arcuately oscillating shock absorber. 3,613,842, Cl. 188-306.

Bucyrus-Erie Company: *See—*
Lindstad, Jon R.; and Stoner, Thomas A., 3,613,805.

Bueler, Richard C., to Wagner Electric Corporation. Control valve. 3,614,169, Cl. 303-6.

Bueller, Karl, to Supramar AG. Tiltable hydrofoil arrangement. 3,613,622, Cl. 114-66.5

Buisson, Marcel. Installation for the compressing and evacuation of household garbage and industrial refuse. 3,613,559, Cl. 100-49.

Bunker Ramo Corporation, The: *See—*
Griff, William, 3,613,230.

Bunker-Ramo Corporation, The: *See—*
Anderson, Norman R.; and Rundle, David F., 3,614,711.
Anderson, Roland Borg, 3,614,403.
Foerster, Roy P., 3,614,777.
Henderson, Martin C., 3,614,411.
Kang, George Su; and Goodwin, Robert Lewis, 3,614,673.

Bunnelle, Philip R., to FMC Corporation. Article sorting apparatus with transfer error reducing arrangement. 3,613,808, Cl. 177-53.

Burbank, John Emerson, to Scovill Manufacturing Company. Coil for slide fastener. 3,613,180, Cl. 24-205.1

Burgess & Associates, Inc.: *See—*
Burgess, Warren C., Jr., 3,613,870.

Burgess, Warren C., Jr., to Burgess & Associates, Inc. Drive and support system for vibratory parts feeder. 3,613,870, Cl. 198-220.

Burk, Duane L., to Caterpillar Tractor Company. Boot-Belleville seal. 3,614,113, Cl. 277-94.

Burke, John F., to United States of America, Army. Anti-shock spin device. 3,613,594, Cl. 102-79.

Burkett, Wilford B.; and Bigbee, John H., III, to McCulloch Corporation. Rapid charging of batteries. 3,614,582, Cl. 320-5.

Burkett, Wilford B.; and Bigbee, John H., III, to McCulloch Corporation. Termination of battery charging. 3,614,584, Cl. 320-35.

Burkett, Wilford B.; and Jackson, Robert V., to McCulloch Corporation. Rapid charging of batteries. 3,614,583, Cl. 320-5.

Burkhardt, Edgar S.; and Torrence, James D., to Allis-Chalmers Manufacturing Company. Concave ring for cone crushers. 3,614,004, Cl. 241-214.

Burndy Corporation: *See—*
Pullen, John, 3,614,291.

Burr, Robert P., to Photocircuits Corporation, mesne. Displacing apparatus. 3,614,757, Cl. 340-174.1

Burrage, Eric C., to Shell Oil Company. Double-bubble spark array. 3,613,823, Cl. 181-0.5

Burroughs Corporation: *See—*
Behr, Michael I.; Blessum, Norman S.; and Wang, James T., 3,614,758.
Bindshelder, Theodore S., 3,614,394.
Hart, Joseph W., 3,614,755.
Radcliffe, Arthur J., Jr., 3,614,749.

Bush, Jack A., to Garlock Inc., mesne. Method and apparatus for making fluid seals. 3,613,223, Cl. 29-527.1

Bushnell, Thomas Wilbur, to Clement, J. W., Company. Fluidic caliper. 3,614,086, Cl. 270-56.

Butler National Corporation: *See—*
Perkins, Earl Stuart; and Wierzbowski, Daniel A., 3,613,247.

Butler, Robert F.: *See—*
Brown, William J.; Butler, Robert F.; Hedden, Smith E.; and Jablovskis, Janis,3,613,592.

Butler, Ronald J. Display unit having integrated cantilever shelves. 3,613,604, Cl. 108-42.

Buxton Incorporated: *See—*
Collings, Dana B.; and Broughton, Douglas J., 3,613,759.

Buynak, George R.; Diamantides, Nicholas D.; and Smith, Richard H., to Goodyear Aerospace Corporation. Charge detector. 3,614,035, Cl. 244-77.

Buzzard, Clair Alan, to Bell Telephone Laboratories, Incorporated. Arrangement for using a data set carrier detector to detect incoming ringing. 3,614,324, Cl. 179-2.

Byrne, Frank, to United States of America, National Aeronautics and Space Administration. Automatic frequency control loop including synchronous switching circuits. 3,614,648, Cl. 331-14.

Cabassut, Andre Emile Roger, to Bertin & Cie. System for reducing noise caused by a stream of fluid. 3,613,826, Cl. 181-33.

Cabot Corporation: *See—*
Morgan, Allan C., 3,614,283.

Caferro, Edward M., to American Sign & Indicator Corporation. Sign module. 3,613,275, Cl. 40-31.

Caldwell, Donald A., to Esso-Research and Engineering Company. Method for determining the amount of free water in hydrocarbons. 3,614,433, Cl. 250-71.

California Computer Products, Inc.: *See—*
McInnis, Andrew M., 3,613,248.

California Institute of Technology: *See—*
Nicolet, Marc-Aurele; and Bilger, Hans Rudolf, 3,614,679.
Scott, Ronald F., 3,613,446.

Callahan, Howard E.: *See—*
Morgan, Albert R., Jr.; Antoun, Paul R.; Callahan, Howard E.; and Maugel, Theodore R.,3,613,328.

Callery Chemical Company: *See—*
Edwards, Lawrence J., 3,613,371.

Cameron, Joe, to International Automated Electronics Corporation, mesne. Telephone actuated switch. 3,614,326, Cl. 179-2.

Campbell, David Alexander, to Rolls-Royce Limited. Gas turbine engine. 3,614,257, Cl. 415-176.

Campbell, Erwin A.: *See—*
Woolslayer, Homer J.; Woolslayer, Joseph R.; Jenkins, Cecil; and Campbell, Erwin A.,3,613,905.

Campbell, William H.: *See—*
Turner, William L.; Campbell, William H.; and Mercer, Robert E.,3,614,155.

Canada her Majesty the Queen in right of: *See—*
Hubbard, Frank T.; and Demers, Gaston, 3,613,499.

Canadian General Electric Limited: *See—*
Speer, Gordon W.; and Williamson, Dennis F., 3,614,461.

Canadian National Railway Company: *See—*
Cass, George Robert, 3,614,615.

Canadian Westinghouse Company, Limited: *See—*
Palmer, Selwyn, 3,614,695.

Cannon, Lee E., to Smith, Darrell S. Circuitry for providing one additional complete playback of a recorded message for each input signal. 3,614,341, Cl. 179-100.2

Canon Kabushiki Kaisha: *See—*
Taguchi, Tatsuya; and Watanabe, Yoshiaki, 3,613,536.
Yazaki, Mutsunobu; and Uchiyama, Takashi, 3,613,534.

Canon Kabushiki Kaisha Co., Ltd.: *See—*
Komori, Shigehiro; Sato, Jiro; and Kurahashi, Akira, 3,614,220.

Canonne, Paul A. G., to L'Industris Electrique De La Seine. Tripping devices. 3,614,689, Cl. 335-229.

Caplan, Sandor, to RCA Corporation. Liquid crystal day/night mirror. 3,614,210, Cl. 350-278.

Capra, Uberto, to Ceccato & Co. S.p.A. Vehicular drying apparatus. 3,613,255, Cl. 34-54.

Carborundum Company, The: *See—*
Eten, Richard L., 3,613,316.

Carlier, Claude; and Gravez, Andre, to Saunier Duval. Systems for loading and unloading elevators. 3,613,927, Cl. 214-622.

Carlson, Elmer T., to Broadhill Development Corporation. Electrical conduit system. 3,614,297, Cl. 174-88.

Carlson, Norman C. Stabilizing device for automotive vehicles. 3,614,126, Cl. 280-150.

Carlson, Richard K., to Bell & Howell Company. Control lever switching mechanism. 3,614,219, Cl. 352-178.

Carlson, V. Robert; Dinelli, Joseph; and Jones, Joel F., to International Harvester Company. Sand trap rake for golf courses. 3,613,802, Cl.

Carmet Company: *See—*
Stier, Henry W., 3,613,197.

Carmet Company, The: *See—*
Davis, Charles S., 3,614,164.

Caroli, Italo, to DBM Industries Limited. Electrode holder. 3,614,370, Cl. 219-69.

Caroma Sales Proprietary Limited: *See—*
Rothauser, Charles; and Thompson, Bruce R., 3,614,059.

Carr, Barney J., deceased0 (by Carr, Elisabeth Helen; administrator), to Kaman Sciences Corporation, mesne. Gas ionizer devoid of coaxial electrodes. 3,614,440, Cl. 250-84.5

Carr, Byrle H. Frictional resistant type exercising device. 3,614,098, Cl. 272-79.

Carr, Elisabeth Helen: *See—*
Carr, Barney J.,3,614,440.

Carr, Irving A. Injection piston for die casting. 3,613,772, Cl. 164-312.

Carrell, Edwin A.: *See—*
Irvin, Eugene, Jr.; and Carrell, Edwin A.,3,613,653.

Carrell, Ross M., to RCA Corporation. Electronic photocomposing system that forms characters of different point sizes. 3,614,767, Cl. 340-324.

Carrier Corporation: *See—*
Linthicum Harley E.; and Bronne, William B., 3,613,853.
Miller, Charles D., 3,613,212.

Carroll, Cornelius F. Arrow head. 3,614,103, Cl. 273-106.5

Carruthers, George A., to Turbo Machine Company. Yarn twist measuring instrument. 3,613,347, Cl. 57-1.

Carson, Forrest L. Adjustable pre-set pressure actuated mechanical prime mover. 3,613,724, Cl. 137-612.1

Carter, Ronald D.: *See—*
Endres, Dan D.; and Carter, Ronald D.,3,613,676.

Cary Instruments: *See—*
George, Kenyon P.; and Siegler, Edouard Horace, Jr., 3,614,227.

Case, J. I. Company: *See—*
Eid, John S., 3,614,135.
Magee, Kenneth L.; and Wilson, John F., 3,614,177.
Stibbe, Paul H., 3,613,462.

Cass, George Robert, to Canadian National Railway Company. Railway vehicle speed indication system. 3,614,615, Cl. 324-161.

Castle, John Frederick: *See—*
Stocks, Leon; and Castle, John Frederick,3,614,081.

Castle, Raymond G., to Cherry Electrical Products Corporation. Slide selector switch apparatus. 3,614,347, Cl. 200-16.

Caterpillar Tractor Company: *See—*
Bubula, Thomas J., 3,613,505.
Burk, Duane L., 3,614,113.
Hammond, James T., 3,613,460.
Hollenberg, Dale W.; Loyd, Calvin D.; and Satzler, Ronald L., 3,613,982.
Kiwalle, Jozef, 3,613,218.
Schubert, George E.; Swayze, Lloyd D.; and Waggoner, John B., 3,613,818.

Catlin, Francis D.: *See—*
Parsons, Hubert J.; Catlin, Francis D.; and Cordier, James,3,613,488.

Cavanaugh, John B.: *See—*
Snyder, Warren E.; Cavanaugh, John B.; and Aubin, Jean-Paul R.,3,613,651.

Cayton, David W.; and Malley, William G., to FMC Corporation. Selective sort vine crop harvester. 3,613,796, Cl. 171-27.

CCI Aerospace Corporation: *See—*
Gabrys, Alfred E., 3,614,254.

C.C.L. Systems Limited: *See—*
Whittaker, William, 3,613,179.

Ceccato & Co. S.p.A.: *See—*
Capra, Uberto, 3,613,255.

Ceepo, Arvo H.; and Jones, John Paul. Ramp type wrecker service vehicle. 3,613,919, Cl. 214-85.1

Cegedur G.P.: *See—*
Colas, Francois, 3,613,194.

Cegielski, Rudolph J., Jr. Snap in drapery brackets. 3,614,045, Cl. 248-262.

CEKA Packaging Limited: *See—*
Christensson, Od Wikar, 3,613,986.

Central Aircraft Manufacturing Company, Inc.: *See—*
McCarty, Lewis C., Jr., 3,614,033.

Ceresa, Raymond John: *See—*
Larsen, Donald Wayne; and Ceresa, Raymond John,3,613,675.

Certain-Teed Products Corporation: *See—*
Swander, Kenneth D., Jr.; and Wearden, Charles G., 3,613,515.

Cervenka, Joseph J.; and Hetzel, Marvin E. Terminal strip. 3,614,718, Cl. 339-276.

Ceskoslovenska akademie ved: *See—*
Glanc, Antonin; and Janovec, Vaclav, 3,614,482.
Hrdina, Jiri, 3,614,242.

Cessna Aircraft Company, The: *See—*
Krehbiel, Robert D.; and Graber, Homer R., 3,613,508.
Phillips, John F., 3,613,503.

Ceyer, Alfons W.: *See—*
Wolak, Norbert S.; Wolak, Thomas J.; and Ceyer, Alfons W.,3,613,312.

Chakhlov, Vladimir Lukianovich: *See—*
Ananiev, Lev Martemianovich; Pekker, Yakov Semenovich; Chakhlov, Vladimir Lukianovich; Sharachin, Yakov Afanasievich; Shtein, Mikhail Mikhailovich; and Yarushkin, Jury Pavlovich,3,614,638.

Chambers, Henry B., to Hydranautics. Fluid pressure apparatus with orbiting oscillator. 3,613,510, Cl. 91-478.

Champion, Ronald Cheyney, to Kenco Coffee Company Limited. Apparatus for conditioning freshly roasted coffee. 3,613,549, Cl. 99-236.

Chance, A. B., Co.: *See—*
Hollander, William L., 3,613,845.

Chance, A. B., Company: *See—*
Beard, Lloyd R.; Mc Naghten, Delmar E.; and Popeck, Charles A., 3,614,700.

Chandler Evans, Inc.: *See—*
Kampe, Robert F.; and White, Albert H., 3,613,708.
Lanctot, Robert S., 3,614,269.

Chaney, Verne E., Jr. Cleansing packet. 3,613,142, Cl. 15-104.94

Chang, Winston H., to General Electric Company. Arc cast ingot. 3,613,210, Cl. 29-187.

Chapman, Ronald H.; and Moore, George G., to Motorola, Inc. Multi-frequency receiver with automatic channel selection and priority channel monitoring. 3,614,621, Cl. 324-334.

Chapman, William C. Pipe wrench adapter. 3,613,486, Cl. 81-180.

Charewicz, Francis J.: *See—*
Stetson, Earl W.; and Charewicz, Francis J.,3,614,523.

Chartier, Andre Maurice, to R. D. T. Societe pour l'Etude, la Realisation et al Diffusion des Techniques Modernes. Winding machine for making tubing. 3,614,005, Cl. 242-7.22

Chase, Albert T.: *See—*
Douglass, James D.; and Chase, Albert T.,3,614,696.

Chatelain, Roger; and Bouis, Hugues, to Compagnie de Saint-Gobain. Apparatus for cutting glass. 3,613,974, Cl. 225-93.5

Chaumont, Guy-Noel. Ski leg for a snowmobile type vehicle. 3,613,809, Cl. 180-5.

Chaveneaud, Roger Marcel; and Janoska, Georges, to Societe a Responsabilite Limitee: Societe Lampy d'Etudes et de Recherches 'S.O.L.E.R.'. Switching device for performing switching operations between input and output lines. 3,614,330, Cl. 179-18.

Chemetron Corporation: *See—*
Stearns, James B.; and Wendelburg, Robert W., 3,614,377.

Chemicke Zavody Julia Dimitrova narodni podnik: *See—*
Lenorak, Ferdinand, 3,614,007.

Cherkas, Max A., to United States of America, Navy. Method of sterilizing aqueous pharmaceutical solutions employing propylene oxide and entrained. 3,613,617, Cl. 424-20.

Chermack, Milton P.: *See—*
Zimmet, Arthur L.; and Chernack, Milton P., 3,614,760.

Chermensky, German Petrovich: *See—*
Muchnik, Vladimir Semenovich; Chermensky, German Petrovich; Nikiforov, Mikhail Andreevich; and Gaiduk, Jury Vladimirovich,3,614,271.

Chernack, Milton P.: *See—*
Zimmet, Arthur L.; and Chernack, Milton P.,3,614,760.

Cherry Electrical Products Corporation: *See—*
Bedocs, Michael F., 3,614,364.
Castle, Raymond G., 3,614,347.

Chester Electronic Laboratories, Inc.: *See—*
Joslow, David L.; and Bosnak, John J., 3,614,322.

Chicago Miniature Lamp Works: *See—*
Jensik, Robert E., 3,614,716.

Child Guidance Toys Inc.: *See—*
Hughes, David C., 3,613,278.

Childs, Elbert B., to Mobil Oil Corporation. Tank run-out warning signal. 3,614,762, Cl. 340-244.

Chiu, Joseph Chak-Fai, to Chiu's Joint System Limited. Constructional systems. 3,613,900, Cl. 211-148.

Chiu's Joint System Limited:*See—*
Chiu, Joseph Chak-Fai, 3,613,900.

Choate, William C., to Texas Instruments, Incorporated. Linear embedded nonlinear adaptive processor. 3,614,398, Cl. 235-150.1

Cholin, Roger R.; and Guest, Kenneth E. Cam locked release mechanism. 3,613,461, Cl. 74-2.

Christensson, Od Wikar, to CEKA Packaging Limited. Arrangement in packages for liquids with pour opening. 3,613,986, Cl. 229-17.

Christin, George, to Etablissments Bertrand Faure. Seat cushion. 3,614,159, Cl. 297-452.

Chrysler Corporation: *See—*
Douglas, Joseph W., 3,614,055.
Seaman, William J., 3,614,209.

Chrysostomides, Stavro A. Cold conization instrument. 3,613,662, Cl. 128-2.

Chumakov, Walter V., to ITE Imperial Corporation. Arcless tap or source switching apparatus using series connected semiconductors. 3,614,464, Cl. 307-136.

Churchin, Elinore: *See—*
West, Emery C., 3,613,238.

Ciampa, Fred A.; and Mazzola, Sergio J., to Ford Motor Company. Compact positive displacement pump. 3,614,266, Cl. 417-79.

Ciarrocchi, John A.: *See—*
Huber, George H.; Gertler, Eugene I.; Habgood, Dennis W.; Ciarrocchi, John A.; and Richman, Walter A.,3,614,765.

Cicero, Frank. Farm equipment. 3,614,120, Cl. 280-32.5

Cinadr, Frank A., to Warner & Swasey Company, The. Square turret indexing mechanism. 3,613,483, Cl. 74-824.

Ciotti, George A., to Smith, A. O., Corporation. Measuring apparatus including rotatably mounted apertured plate means for measuring the charge in electrically charged flowing liquid. 3,614,602, Cl. 324-32.

Clark Equipment Company: *See—*
Wallace, Gersen L., 3,614,273.

Clark, Harry C. Article lifting attachment for an excavator. 3,613,922, Cl. 214-138.

Clark, Walter L., 1/2 to Derderian, Edward J. Combined golf ball retriever and rake. 3,614,149, Cl. 294-19.

Clausen, Jorgen Rono: *See—*
Borchers, Alwin; Sjotun, Kyrre Guttorm; Hansen, Gunnar Lyshoj; and Clausen, Jorgen Rono,3,614,494.

Clayton Dewandre Company Limited: *See—*
Page, Wilbur Mills; and Coupland, Ralph, 3,614,170.

Clayton Manufacturing Company: *See—*
Tinkham, Leland P., 3,613,440.

Clegg, Kenneth K., Jr. Submerged suction strainer for a water hose. 3,613,894, Cl. 210-456.

Clement, J. W., Company: *See—*
Bushnell, Thomas Wilbur, 3,614,086.

Clement, Vernon D. Drapery process machine. 3,613,967, Cl. 223-32.

Clements, Thomas C., to Neptune Meter Company. Analog-to-digital shaft encoder with anti- ambiguity binary digital code output. 3,614,774, Cl. 340-347.

Clevite Corporation: *See—*
Berlincourt, Don A., 3,614,483.
Closmann, Philip J.; and Phocas, Dionysios M., to Shell Oil Company. Process for horizontally fracturing subsurface earth formations. 3,613,785, Cl. 166-271.
Cloutier, Charles C., to Anti-Pollution, Inc. Oil removal apparatus. 3,613,891, Cl. 210-242.
CMI Corporation: *See—*
Brock, James D., 3,614,071.
Coburn, Charles W., to Ickes-Braun Glasshouses, Inc. Plant cultivation. 3,613,309, Cl. 47-38.
Codex Corporation: *See—*
Holsinger, Jerry Lee, 3,614,622.
Cofer, Daniel B.; and Bass, Joseph A., to Southwire Company. Continuous casting and rolling of 6201 aluminum alloy. 3,613,767, Cl. 164-76.
Cofer, Larry Wilson, to Deere & Company. Crop-handling means and stripper therefor. 3,613,345, Cl. 56-364.
Coffenberry, James H.: *See—*
Bench, Thomas E.; and Coffenberry, James H.,3,613,580.
Cogar Corporation: *See—*
Tu, George K., 3,614,467.
Cogliano, Joseph A. Catamaran. 3,613,136, Cl. 9-1.
Cohen, Paul, to Subcom, Inc. Communicating passage for submersible vessels. 3,613,640, Cl. 114-16.
Cohn, Mark J. Film holding camera construction and film package. 3,613,545, Cl. 95-66.
Colas, Francois, to Cegedur G.P. Method and means for producing a railway carriage roof. 3,613,194, Cl. 29-33.
Cole Parmer Instrument Company: *See—*
Gilmont, Roger; and Portyrata, Raymond E., 3,613,952.
Cole-Hersee Company: *See—*
Introvigne, Angelo, 3,614,537.
Coleman, Bernard: *See—*
Haydu, John L.; and Coleman, Bernard,3,614,680.
Coleman, Bestor P., to Interlake, Inc. Adjustable platen track. 3,613,557, Cl. 100-26.
Coleman, John W., to Forgflo Corporation. Electron beam injection and focusing means suitable for electron microscope. 3,614,520, Cl. 315-15.
Coleman, William E.; and Skutt, Robert R., to National Cash Register Company, The. Full select-half select plasma display driver control. 3,614,769, Cl. 340-324.
Colgren, Theodore; and Kane, Morris W., to Brown Company. Expansion meter. 3,613,437, Cl. 73-73.
Collier, Edward L.: *See—*
Gourdine, Meredith C.; Collier, Edward L.; Lewis, Gerald P.; Mc Crae, Harold; and Port, Donald H.,3,613,993.
Collings, Dana B.; and Broughton, Douglas J., to Buxton Incorporated. Purse carrying strap and frame assembly. 3,613,759, Cl. 150-29.
Collings, Harold E.; and Darby, William L., to General Electric Company. Universal liquid-cooled connection assembly. 3,614,493, Cl. 310-54.
Collins Radio Company: *See—*
Brown, James L., 3,614,591.
Ellis, David W., 3,614,686.
Foster, Jimmie L., 3,614,036.
Hill, John Dan, III, 3,614,674.
Huntsinger, Dean P.; and Lundgreen, Michael W., 3,614,619.
Collins, Samuel C., to Cryogenic Technology, Inc. Method and apparatus for continuously supplying refrigeration below 4. 2 K. 3,613,387, Cl. 62-100.
Colston, John R., to Bowles Fluidics Corporation. Turbine speed control. 3,613,369, Cl. 60-105.
Colt's Inc.:*See—*
Kennedy, Ralph C., 3,613,285.
Columbia Broadcasting System, Inc.: *See—*
Goldberg, Abraham A., 3,614,302.
Portman, Warren C., 3,614,224.
Columbia Broadcasting Systems, Inc.: *See—*
Beiser, Leo, 3,614,193.
Colwell, Robert E.: *See—*
Tapp, James S.; Colwell, Robert E.; and Toney, Myron K.,3,613,988.
Comas, Jorge Rectoret. Circular knitting machine sinkers. 3,613,402, Cl. 66-107.
Commissariat A l'Energie Atomique:*See—*
Allemand, Robert; Jacobe, Jean; and Roudaut, Edouard, 3,614,437.
Communications Patents Limited: *See—*
Gargini, Eric John, 3,614,669.
Compagnie de Saint-Gobain: *See—*
Chatelain, Roger; and Bouis, Hugues, 3,613,974.
Compagnie des Ateliers et Forges de la Loire: *See—*
Troton, Jacques, 3,614,379.
Compagnie Francais de Petroles Soc'ete Anonyme: *See—*
Orieux, Pierre P., 3,613,727.
Compagnie Generale de Radiologie: *See—*
Vacher, Fernand L., 3,614,427.
Compagnie Generale d'Electricite:*See—*
Maillet, Henry, 3,614,025.
Royet, Jean, 3,614,301.
Compagnie Generale des Establissements Michelin: *See—*
Lejeune, Daniel, 3,614,732.
Concept, Inc.: *See—*
Naylor, Richard Norman, 3,613,682.
Conductron Corporation: *See—*
Graham, Robert R.; Siegel, Keeve M.; and Vivian, Weston E., 3,614,778.
Conger, Gary L. Door seal unit. 3,613,324, Cl. 52-173.
Conn, Harry; Mauk, Robert W.; and Lancaster, Paul M., to Whitney, W. A., Corporation. Punch press. 3,613,493, Cl. 83-639.
Connolly, Walter L.; Andree, Harold C.; and Harrison, Ralph M., to Grove Valve and Regulator Company. Automatic machine tool. 3,614,250, Cl. 408-3.
Connor, Andy: *See—*
Schilling, Robert G., Jr., 3,613,292.
Consolidated Foods Corporation: *See—*
Descarries, Raymond; Gaudry, Paul E.; and Ohlson, B. Erik, 3,614,705.
Constructeurs Associes pour le Montage d'Ouvraces Metalliques, Constructions Metalliques de Provence and Compagnie Industrielle Maritime:*See—*
Schlecht, Francis, 3,613,937.
Continental Can Company, Inc.: *See—*
Loritz, Edward F.; and Unger, Harold W., 3,613,613.
Contra Costa County Water District: *See—*
Harris, W. Leslie, 3,613,888.
Contraves AG: *See—*
Schoen, Kurt, 3,614,607.
Control Data Corporation: *See—*
Eshleman, Dean B.; and D'Entremont, Alice M., 3,614,776.
Controls Company of America: *See—*
Ostrowski, Edwin A., 3,613,735.
Yatsushiro, Kenji; and Kuchuris, George F., 3,614,492.
Conway, Malcolm J. Method and means for enhancing mental imaging capabilities. 3,613,266, Cl. 35-22.
Cook, Kenneth J.: *See—*
Horwitz, Norman H.; and Cook, Kenneth J.,3,614,434.
Cook, Miles H.; Nystrom, Walter; Secrist, Duane R.; and Turk, Harold L., to International Business Machines Corporation. Manufacture of multi-element magnetic head assemblies. 3,613,228, Cl. 29-603.
Coon, John M.: *See—*
Sturm, Rolland G.; and Coon, John M.,3,613,615.
Copystatics Manufacturing Corporation: *See—*
Van Auken, John A.; Rush, Christopher; Blank, Fritz A.; Hoffman, Lionel; and Barto, Robert, 3,614,089.
Corbin, Thomas H.; and Kienitz, Martin E., to Smith Kline Instruments, Inc. System and method employing video equipment for remote monitoring of body function activities. 3,613,669, Cl. 128-2.06
Cordier, James: *See—*
Parsons, Hubert J.; Catlin, Francis D.; and Cordier, James,3,613,488.
Corey, Dwight O., to Ambac Industries, Incorporated. Press for formation of molded objects. 3,613,165, Cl. 18-16.5
Corning Glass Works: *See—*
Davis, John B., 3,613,177.
Cornsweet, Tom N.; Eilers, George J.; and Crane, Hewitt D., to Stanford Research Institute. Method and system for taking photographs of an eye fundus. 3,614,214, Cl. 351-7.
Corsi, George L.: *See—*
Berens, Alfred S.; Bainard, Dean R.; and Corsi, George L.,3,614,183.
Cosentino, Louis Salvatore: *See—*
Stewart, Wilber Clarence; and Cosentino, Louis Salvatore,3,614,189.
Cosman, Armond D.; and Snider, Albert L., to Austron, Inc. Electromechanical reed system. 3,614,485, Cl. 310-8.2
Cosner, Lawrence N.: *See—*
Pearson, John; McLean, William B.; and Cosner, Lawrence N.,3,613,581.
Costa, Giuseppe, to Verrina S.p.A. Hydraulic driving device for bending presses. 3,613,365, Cl. 60-52.
Costa, Guillermo Galceran, to Maschinenfabrik Memmingen Espanola, S.A. Flyer spindle for two-for-one twisting machine. 3,613,348, Cl. 57-58.86
Cottrell, Harold L., to Power Control, Inc. Hydraulic transmission. 3,613,366, Cl. 60-54.
Coulter Electronics, Inc.: *See—*
Shaw, Clyde C., 3,614,231.
Coupland, Ralph: *See—*
Page, Wilbur Mills; and Coupland, Ralph,3,614,170.
Court, Wilbur M.: *See—*
Lense, Robert F.; and Court, Wilbur M.,3,613,525.
Courtaulds Limited: *See—*
Jeffcoat, Keith; and Betts, Max William, 3,613,401.
Cowlam, Kenneth William, to Polygram Casting Company Limited. Shell moulding machine with pivotable investment bin. 3,613,769, Cl. 164-166.
Cox, Dwight J., to Mc Dermott, Ray J., & Co., Inc. Offshore structures and their installation. 3,613,381, Cl. 61-46.5
Cox, Jay A.: *See—*
United States of America,National Aeronautics and Space Administration, Administrator, 3,614,772.
Cox, Victor Ian Malcolm, to Albro Fillers and Engineering Company Limited. System of driving a plurality of machines. 3,613,858, Cl. 198-19.
Coyle, Jan R. Liquid activated system. 3,614,542, Cl. 317-151.

Craddock, Charles L. Random flashing circuit including a voltage step-up converter. 3,614,528, Cl. 315-241.

Crane, Hewitt D.: *See—*
Cornsweet, Tom N.; Eilers, George J.; and Crane, Hewitt D.,3,614,214.

Crawford, Harry M., to Esso Research and Engineering Company. Apparatus and method for sampling and analyzing fluid solids. 3,614,230, Cl. 356-36.

Crees, Silas R. Wire bending apparatus. 3,613,430, Cl. 72-318.

Criner, Harry E.: *See—*
Blackburn, Marvin J.; and Criner, Harry E.,3,614,077.

Crisp, Phillip L. Leak proof water spigot. 3,614,058, Cl. 251-266.

Crosby, David Winston, to Imperial Chemical Industries Limited. Nonwoven fabrics and a process for making them. 3,613,190, Cl. 28-4.

Crump, Gerald L. Locking device for a removable connector. 3,613,411, Cl. 70-232.

Crump, Ralph E.; Reynolds, Frank L.; and Tillstrom, Carl R., to Frigitronics of Connecticut, Inc. Cryosurgical apparatus. 3,613,689, Cl. 128-303.1

Crutcher, James E.: *See—*
United States of America,National Aeronautics and Space Administration, Administrator, 3,613,457.

Cryogenic Engineering Company: *See—*
Leonard, Kenneth R., 3,613,934.

Cryogenic Technology, Inc.: *See—*
Collins, Samuel C., 3,613,387.
Hogan, Walter H.; and Stuart, Robert W., 3,613,385.

Csapo, Tibor J.: *See—*
Newton, Robert F.; and Csapo, Tibor J.,3,613,224.

Cummins Engine Company, Inc.: *See—*
Neff, Joseph J., 3,614,259.

Cummins, Stewart E. Ferroelectric gadolinium molybdate compensation type bistable light gate and logic cell having memory. 3,614,754, Cl. 340-173.2

Cunningham, Isaiah V. Steering column assemblies. 3,613,476, Cl. 74-49.

Cunningham, John B. Adjustable arm board. 3,614,085, Cl. 269-328.

Cunningham, Robert E.: *See—*
Mottern, John W.; Cunningham, Robert E.; and Bell, Robert P.,3,613,158.

Curry, Truman M., to Boeing Company, The. Large scale external balance for windtunnels. 3,613,443, Cl. 73-147.

Curtis, Daniel L., to Litton Systems, Inc. Self-regulating cooling system. 3,613,775, Cl. 165-46.

Curtiss-Wright Corporation: *See—*
Eibsen, Richard S., 3,614,275.

Cuthbert, Victor W., to Whirlpool Corporation. Apparatus for supporting articles in a dishwasher. 3,614,187, Cl. 312-351.

Cutler, Hymie, to Bendix Corporation, The. Numerical control system with controlled dwell. 3,614,575, Cl. 318-569.

Cutler-Hammer, Inc.: *See—*
Keranen, John J., 3,614,362.

CWS Apparate AG: *See—*
Rasmussen, Holger O., 3,613,478.

Czarnecki, Thomas H., Sr. Cable supported roof construction. 3,613,322, Cl. 52-83.

Daggett, Byron G. Device for positioning and adjusting relatively hard teeth of a circular saw. 3,613,211, Cl. 29-200.

Dahlsten, Gunnar, to Molnlycke Aktiebolag. Sanitary towel. 3,613,688, Cl. 128-290.

Daimler-Benz Aktiengesellschaft: *See—*
Maier, Rolf, 3,613,825.

Dandini, Juliana S. Game apparatus utilizing dice and cards. 3,614,105, Cl. 273-146.

Danfoss A/S: *See—*
Borchers, Alwin; Sjotun, Kyrre Guttorm; Hansen, Gunnar Lyshoj; and Clausen, Jorgen Rono, 3,614,494.
Ohrberg, Carl V., 3,614,265.
Ohrberg, Carl V., 3,614,274.

Dannatt, Hugh St. Lawrence, to Singer Company, The. Keyboard control circuit. 3,614,471, Cl. 307-241.

Darby, William L.: *See—*
Collings, Harold E.; and Darby, William L.,3,614,493.

Data-Control Systems, Inc.: *See—*
Runyan, Raymond A.; and Ott, Owen J., 3,614,627.

Dataco Systems Corporation: *See—*
Higgins, Leonard James, 3,614,402.

Dauenbaugh, Robert L.: *See—*
Glass, Dwight W.; and Dauenbaugh, Robert L.,3,613,413.

Daughhetee, Daniel W. Spare tire bracket apparatus. 3,613,972, Cl. 224-42.42

Daughton, John W.; Donohue, James M.; and Schluntz, Gary L., to Xerox Corporation. Multiple sheet detection system. 3,614,419, Cl. 250-223.

Davey, Charles T.: *See—*
Amicone, Raymond George; Davey, Charles T.; and Dunning, Warren J.,3,613,795.

David, Vivian, to Westinghouse Brake and Signal Company Limited. Information transmission system. 3,614,620, Cl. 325-30.

Davidson, Richard M., to Bell & Howell Company. Record handling device. 3,614,021, Cl. 242-188.

Davies, Alan, to United Kingdom Atomic Energy Authority. Electric high voltage generators. 3,614,588, Cl. 321-8.

Davis, Charles E. Auto alarm system. 3,614,734, Cl. 340-64.

Davis, Charles S., to Carmet Company, The. Mine tool adapter. 3,614,164, Cl. 299-83.

Davis, Earl Crittlon, Jr., to Deere & Company. Cam and roller guide means for tree shearing blades. 3,613,752, Cl. 144-34.

Davis, Henry J., to Automation International, Inc. Machine for removing bungs from kegs. 3,613,332, Cl. 53-381.

Davis, John B., to Corning Glass Works. Anchoring clip for mounting appliances. 3,613,177, Cl. 24-73.

Davis, Lawrence P.: *See—*
United States of America,National Aeronautics and Space Administration, Administrator, 3,613,457.

Davis, Michael, to Mayfab, Inc. Center folded travel bag. 3,613,843, Cl. 190-50.

Davis, Paul, to Sweetheart Plastics, Inc. Slice feeding lid. 3,613,940, Cl. 220-60.

Day, Bernard E.: *See—*
Deits, William C.; and Day, Bernard E.,3,614,499.

Day, Vearl. Variable tensioning cable drive for yarders and the like. 3,614,066, Cl. 254-185.

DBM Industries Limited: *See—*
Caroli, Italo, 3,614,370.

Deboo, Gordon J., to United States of America, National Aeronautics and Space Administration. Phase shift circuit apparatus. 3,614,475, Cl. 307-262.

Dediemar, Ronald B.: *See—*
Archer, Fred Curtis; Dediemar, Ronald B.; and Schuman, LeRoy J.,3,614,023.

Deere & Company: *See—*
Cofer, Larry Wilson, 3,613,345.
Davis, Earl Crittlon, Jr., 3,613,752.
Forth, Murray W., 3,613,335.
Meylink, John Gary; and Bishop, Robert James, 3,613,815.
Moriceau, Pierre; and Baudet, Jean Pierre, 3,614,134.
Roth, Robert Richard, 3,613,801.

Deitch Sewing Machine and Supply Co.: *See—*
Pararra, Julius, 3,614,006.

Deitch, William, d/b/a: *See—*
Pararra, Julius, 3,614,006.

Deits, William C.; and Day, Bernard E., to General Electric Company. Target structure for camera tubes consisting of a magnesium oxide layer supported on one side of a metal mesh. 3,614,499, Cl. 313-65.

Delagi, Bruce A.; McFarland, Harold L., Jr.; and O'Loughlin, James F., to Digital Equipment Corporation. Data processing system with circuits for transferring between operating routines, interruption routines and subroutines. 3,614,740, Cl. 340-172.5

Del Ben, Reno A.: *See—*
Harvey, Robert J., 3,614,243.

Del Vecchio, George D.; Schwartz, Edward A.; and Yarger, Norman L., to Xerox Corporation. Document conveyor. 3,614,090, Cl. 271-51.

Demag Aktiengesellschaft: *See—*
Kampf-Emden, Gerd; Horst, Heinz; and Klapdohr, Friedrich Wilhelm, 3,614,160.
Schwarzenberg, Karl-Heinz; and Michel, Rolf, 3,613,429.

Demboski, Henry. Balloon destruct descent and recovery system. 3,614,031, Cl. 244-32.

Demers, Gaston: *See—*
Hubbard, Frank T.; and Demers, Gaston,3,613,499.

Dempster Brothers, Inc.: *See—*
Liberman, Harvey W.; Wade, James A.; and Voorhees, Steven C., 3,613,569.

Denise, Francois Emile Clement: *See—*
Ribour, Jean Louis; and Denise, Francois Emile Clement,3,614,666.

Denne, William A. Device for orienting axes of bodies for inspection. 3,614,229, Cl. 356-31.

De Nobel, Richard W.; Schurman, Donald G.; Lindstadt, Theodore J., Jr.; and Koenig, Hans A., to United States of America, Navy. Payout coil impregnated with conductive adhesive. 3,613,619, Cl. 114-21.

Dent, Calvin J., to White, David Lynn. Combined bumper and tool box. 3,614,136, Cl. 280-500.

Dent, Robin W.; Oatfield, John C.; and Mayes, Richard T., to Monsanto Company. Fabric characterizing apparatus. 3,613,445, Cl. 73-159.

D'Entremont, Alice M.:*See—*
Eshleman, Dean B.; and D'Entremont, Alice M.,3,614,776.

Dentsply International Inc.: *See—*
Stram, George H.; Williams, Ralph J.; Altland, George E.; and Dunn, Thomas J., 3,613,131.

De Pue, Dolen A. Safety guard arrangement for circular saw. 3,613,748, Cl. 143-43.

Derderian, Edward J.: *See—*
Clark, Walter L., 3,614,149.

De Remo, David W.: *See—*
Werth, Lawrence A.; and De Remo, David W.,3,613,700.

Descarries, Raymond; Gaudry, Paul E.; and Ohlson, B. Erik, to Consolidated Foods Corporation. System and apparatus for electrically connecting a vacuum cleaner and a remote motor driven brush tool. 3,614,705, Cl. 339-8.

DeShazo, Earl L., Jr., to Phillips Petroleum Company. Unijunction transistor relaxation oscillator with rapid capacitor discharge circuit. 3,614,650, Cl. 331-52.

Detroit Bullet Trap Corporation: *See—*
Nikoden, Joseph, Sr., 3,614,102.

Detroit Coil Company: *See—*
Jencks, David C., 3,614,690.
Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See—*
Biegler, Hanns, 3,613,159.
Develco, Inc.: *See—*
Rorden, Louis H., 3,614,630.
Deverell, Harry E.; and Muscatell, Frank L., to Allegheny Ludleum Steel Corporation. Ceramic die and method of making same. 3,613,433, Cl. 72-467.
Devgun, Balbir Singh: *See—*
Mohan, Chandra; Rihal, Gursharan Singh; and Devgun, Balbir Singh,3,613,798.
De Woskin, Irvin S., to Beltx Corporation. Sanitary panty garment. 3,613,686, Cl. 128-288.
Deyo, Bruce; and Klaus, Frank J. Drill stem storage and handling mechanism. 3,613,906, Cl. 214-2.5
DeZurik Corporation: *See—*
Nelson, David E., 3,614,479.
Dialessi, John A.: *See—*
Wilska, John E.; Felix, Harold F.; Dialessi, John A.; and Emerson, Fred C.,3,613,657.
Diamantides, Nicholas D.: *See—*
Buynak, George R.; Diamantides, Nicholas D.; and Smith, Richard H.,3,614,035.
Dick, A. B., Company: *See—*
Kievit, James M., 3,614,766.
Dick, Heinrich, to Voith Getriebe KG. Method of actuating magnetic valves and circuit for carrying out said method. 3,614,543, Cl. 317-154.
Dickinson, Bryan J., to West Construction Enterprises, Inc. Sea wall construction. 3,613,382, Cl. 61-49.
Diehl: *See—*
Machmer, Wilhelm, 3,613,990.
Dietch, Leonard, to Zenith Radio Corporation. Black-surround color picture tube. 3,614,503, Cl. 313-92.
Difley, Charles R.: *See—*
Bottas, Michael J.; Difley, Charles R.; and Miller, Frank E.,3,613,568.
Difley, Charles R., to Whirlpool Corporation. Refuse compactor. 3,613,561, Cl. 100-53.
Shapleigh, Lloyd P., Jr.; and Difley, Charles R.,3,613,566.
Digital Equipment Corporation: *See—*
Delagi, Bruce A.; McFarland, Harold L., Jr.; and O'Loughlin, James F., 3,614,740.
McFarland, Harold L., Jr.; and O'Loughlin, James F., 3,614,741.
Ruben, Murray, 3,614,743.
Dillard, George M., to United States of America, Navy. Radar detector system. 3,614,626, Cl. 325-323.
Dilienbeck, Robert H., to General Electric Company. Monopole mass spectrometer. 3,614,420, Cl. 250-41.9
Dinella, Donald; and Schutz, Eckert Franz, to Western Electric Company, Incorporated. Photoprinting apparatus. 3,614,225, Cl. 355-85.
Dinelli, Joseph: *See—*
Carlson, V. Robert; Dinelli, Joseph; and Jones, Joel F.,3,613,802.
Di Noto, Charles J., Jr. Alarm circuit. 3,614,278, Cl. 431-16.
Dionne, Norman J. Raytheon Company Traveling wave electron interaction device having efficiency enhancement means. 3,614,517, Cl. 315-36.
Diprose, Kenneth Victor; and Forbes, Arthur Stuart, to Hancock & Co., (Engineers) Limited. Scanning system for following an outline. 3,614,448, Cl. 250-202.
Disbrow, Donald R.: *See—*
Freed, Jacob B.; and Disbrow, Donald R.,3,614,060.
Dissmeyer, Fred W.; and Olson, George E., to Smith, A. O., Harvestore Products, Inc. Unloading mechanism for sealed storage structure. 3,613,912, Cl. 214-17.
Di Tore, Ralph M.: *See—*
Snyder, Roy C., Jr.; and Di Tore, Ralph M.,3,613,756.
Di Tucci, Charles. Attachment for air-cooled cooling units. 3,613,392, Cl. 62-184.
Dobler, Erich: *See—*
Franke, Horst; and Dobler, Erich,3,614,270.
Docker, Leslie Thomas, to Slumberland Group Limited. Application of ventilators and similar fittings to articles of upholstery. 3,613,196, Cl. 29-91.
Doerner, William A., to Du Pont de Nemours, E. I., and Company. Rotary heat engine. 3,613,368, Cl. 60-95.
Doggett, Frederick F.; and Jenne, Leonard W., Jr. Electron gun convergence assembly. 3,614,502, Cl. 313-77.
Doi, Tomeji: *See—*
Takimura, Shojiro; Doi, Tomeji; and Kuawamoto, Hiroshi,3,613,319.
Donnelly, James G. Receptacle device for food and beverage products or the like. 3,613,872, Cl. 206-4.
Donohue, James M.: *See—*
Daughton, John W.; Donohue, James M.; and Schluntz, Gary L.,3,614,419.
Donzelle, Gerald. Holographic process. 3,614,426, Cl. 250-61.5
Dora, Ralph A., to Packard Instrument Company, mesne. Valve system. 3,613,729, Cl. 137-624.18
D'Ore Mills, Inc.:*See—*
Dore, Robert F., 3,614,002.
Dore, Robert F., to D'Ore Mills, Inc. Dry fine crusher. 3,614,002, Cl. 241-51.
Dorman, Dennis J.: *See—*
Russell, Edward J.; Brown, Gaylord W.; and Dorman, Dennis J.,3,613,571.
Doryokuro Kakunenryo Kaihatsu Jigyodan: *See—*
Oyama, Yoshitoshi; Takashima, Yoichi; and Aoki, Shigebumi, 3,613,989.
Dosch, Peter; Heck, Reinhard; and Hubeli, Ernst, to Heberlein & Co., AG. Weft yarn control apparatus. 3,613,744, Cl. 139-371.
Double A Products Company: *See—*
Johnson, Charles E., 3,613,715.
Douglas, Ellwood S.; and Wahlgren, Wallace W., to Rucker Company, The. Ground fault detector and circuit interrupter by magnetic flux storage method. 3,614,533, Cl. 317-18.
Douglas, Joseph W., to Chrysler Corporation. Pressure regulating valve. 3,614,055, Cl. 251-61.2
Douglass, James D.; and Chase, Albert T., to McGraw-Edison Company. Lamination construction for transformer core and core including same. 3,614,696, Cl. 336-215.
Dow Chemical Company, The: *See—*
Behr, Raymond D.; Friebe, Edward A.; and Brandow, Earl E., 3,613,524.
Drake, Lewis R.; and Erickson, Neil R., 3,613,436.
Stout, Caleb; Smith, Charles F.; and Nolan, Thomas J., III, 3,613,790.
Walles, Wilhelm E., 3,613,957.
Dowd, Eugene G.: *See—*
Hluchan, Stpehen A.; Herman, Sidney; and Dowd, Eugene G.,3,614,731.
Dowell, Frederick Sidney. Friction element assembly support and actuating means for disc brakes. 3,613,836, Cl. 188-71.1
Downs, William T.: *See—*
Posh, Raymond C.; and Downs, William T.,3,613,359.
Drake, Herbert E.: *See—*
Kolb, Edwin R.; and Drake, Herbert E.,3,614,764.
Drake, Lewis R.; and Erickson, Neil R., to Dow Chemical Company, The. Non-destructive testing of pressure vessels. 3,613,436, Cl. 73-37.
Draper Brothers Company: *See—*
Jamieson, Thomas A., 3,613,258.
Dravo Corporation: *See—*
Schmidt, Werner; and Hess, Rudolf, 3,614,076.
Dresser Industries, Inc.: *See—*
Hopfe, Dieter H.; and Wilson, William P., Sr., 3,613,456.
Rehm, William A.; Griffin, Phil H., III; and Sharki, Martin J., 3,614,761.
Wallace, Richard W.; and Pavlica, Stanley R., 3,613,166.
Drevard, Michel; Mognetti, Charles; and Vermot, Andre, to Automobiles Peugeot, and Regie Nationale des Usines Renault. Universal joint. 3,613,396, Cl. 64-21.
Druen, Bernhard: *See—*
Anna, Otto; Kassner, Jochen; and Druen, Bernhard,3,614,491.
Du Bois, Bert, to Tenneco Inc. Multi-louver roughness silencer. 3,613,828, Cl. 181-48.
Dubroff, Stanley, to United States of America, Army. High explosive anti-tank shell. 3,613,585, Cl. 102-52.
Dudley, Leslie Peter. Integral photography. 3,613,539, Cl. 95-18.
Dulebohn, David H., to Andrew Engineering Company. Tracer controlled machining by electrically induced erosion. 3,614,372, Cl. 219-69.
Dunham, Robert W.; and Vyskocil, Charles D., to Square D Company. Molded case electric circuit breaker with fuse and indicator lamp. 3,614,697, Cl. 337-6.
Dunlap, Henry F.; and Wilson, Robert, to Atlantic Richfield Company. Underground storage. 3,613,378, Cl. 61-0.5
Dunlop Holdings Limited: *See—*
Fletcher, Henry R., 3,613,763.
Dunn, Thomas J.: *See—*
Stram, George H.; Williams, Ralph J.; Altland, George E.; and Dunn, Thomas J.,3,613,131.
Dunning, Warren J.: *See—*
Amicone, Raymond George; Davey, Charles T.; and Dunning, Warren J.,3,613,795.
Dunster, Frederick H., to Big Ben Scaffolding Limited. Scaffolding. 3,613,832, Cl. 182-179.
Du Pont de Nemours, E. I., and Company: *See—*
Bentley, Thomas P.; and Miller, Donald F., 3,613,999.
Doerner, William A., 3,613,368.
Felton, Herman R., 3,614,452.
Duquette, Paul E. Top roll assembly for spinning frames. 3,613,199, Cl. 29-116.
Dura Corporation: *See—*
Adamski, Joseph; and Grim, James W., 3,614,065.
Dymoke-Bradshaw, Leslie Eugene Basil; and Tester, Norman William, to International Standard Electric Corporation. Electroacoustic transducer held together by thermoplastic clamping ring. 3,614,335, Cl. 179-115.5
Dynamit Nobel Aktiengesellschaft: *See—*
Gawlick, Heinz; Marondel, Gunther; Bendler, Hellmut; and Siegelin, Werner, 3,613,758.
Dytro Corporation: *See—*
Raphael, Martin, 3,614,576.

Easter, Edmond: *See—*
Benson, James M.; and Easter, Edmond,3,613,448.
Eastman Kodak Company: *See—*
Beach, David E., 3,613,541.
Edelman, Robert I.; and Edwards, Evan A., 3,614,012.
Egan, John F., 3,613,977.
Frank, Paul B.; Mangan, Thomas R., Sr.; and McFall, John C., 3,613,714.
Frost, David A., 3,613,537.
Kohler, John C.; Sutliff, Robert C.; and Zollo, Corrado, 3,613,876.
Lorenzini, Raymond, 3,613,531.
Ott, Howard F., 3,614,223.
Easton, Richard A.: *See—*
United States of America,National Aeronautics and Space Administration, Administrator, 3,614,327.
Ebauches S.A.: *See—*
Soder, Robert, 3,613,202.
Ebner, Harry F.: *See—*
Tobin, Joseph M.; Tauson, Peter O.; Fleischer, Leonard R.; and Ebner, Harry F.,3,613,655.
Ebser, Gottlieb, Maschinenfabrik K.-G.: *See—*
Ebser, Willi, 3,614,165.
Ebser, Willi, to Ebser, Gottlieb, Maschinenfabrik K.-G. Work holder for processing brush bodies. 3,614,165, Cl. 300-10.
Eccles, William, to Harvey-Westbury Corporation. Swimming platform for boats. 3,613,137, Cl. 9-1.
Eck, Ignaz. Shower bath attachment. 3,614,244, Cl. 401-28.
Eddington, George D. Fluid-powered, positive-displacement engine. 3,613,511, Cl. 91-502.
Eddystone Machinery Company: *See—*
Aulen, Walter E., 3,614,010.
Edelman, Alfred E., to Vicon Products Corporation. Fiber illuminator. 3,614,415, Cl. 240-2.18
Edelman, Robert I.; and Edwards, Evan A., to Eastman Kodak Company. Elimination of backing paper shortage in roll film cartridges. 3,614,012, Cl. 242-71.2
Edenhofer, Harry J., to Prince Instruments, Inc. Heartbeat monitor with audio and visual outputs. 3,613,670, Cl. 128-2.06
Edler, Erich: *See—*
Schumann, Fritz; and Edler, Erich,3,613,175.
Edlund, Ulf, to Forsvarets Fabriksverk. Replaceable ignition unit for a recoilless gun cartridge. 3,613,588, Cl. 102-44.
Edwards, Evan A.: *See—*
Edelman, Robert I.; and Edwards, Evan A.,3,614,012.
Edwards, George W. Manufacture of circuit boards. 3,613,232, Cl. 29-625.
Edwards, Lawrence J., to Callery Chemical Company. Hypergolic bipropellant propulsion process using boron components. 3,613,371, Cl. 60-214.
Egan, John F., to Eastman Kodak Company. Means for securing and releasing strip end portions. 3,613,977, Cl. 226-91.
Egg Express, Inc.: *See—*
Snyder, Roy C., Jr.; and Di Tore, Ralph M., 3,613,756.
Eggenberger, Markus A., to General Electric Company. Turbine overspeed trip anticipator. 3,614,457, Cl. 290-40.
Egler, Joseph J., to Guardian Electric Company. Relay with lock-in and manual reset. 3,614,684, Cl. 335-166.
Ehlbeck, Heinz-Wilhelm; and Engbert, Reiner, to Telefunken Patentverwertungsgesellschaft m.b.H. Logic circuit. 3,614,468, Cl. 307-215.
Ehle, Joachim, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Closure for high pressure container. 3,613,939, Cl. 220-46.
Eibsen, Richard S., to Curtiss-Wright Corporation. Control means for bi-directional rotary fluid motor system. 3,614,275, Cl. 418-206.
Eichelberger, Charles D.; and Kosich, Lawrence J., to General Electric Company. Shutter arrangement for a switchgear unit. 3,614,350, Cl. 200-50.
Eickmann, Karl. Added fluid flow control means for governing the attitude of fluid borne vehicles. 3,614,029, Cl. 244-17.23
Eid, John S., to Case, J. I. Company. Weight box attachments for tractors. 3,614,135, Cl. 280-491.
Eie, Nils. Sole for a ski boot. 3,613,270, Cl. 36-2.5
Eilers, George J.: *See—*
Cornsweet, Tom N.; Eilers, George J.; and Crane, Hewitt D.,3,614,214.
Einfalt, Alfred, to Gebruder Einfalt, Firma. Track toy. 3,613,304, Cl. 46-206.
Eisele, Charles W., to Price, H. C., Co. Holiday detector utilizing staggered capacitor discharges for producing a fast rise time high voltage pulse. 3,614,605, Cl. 324-54.
Ekenberg, Christer U.: *See—*
Holst, Jan-Olov M.; Nordstrom, Rolf E.; and Ekenberg, Christer U.,3,614,176.
Ekstrom Industries, Inc.: *See—*
Koepfgen, William S., 3,614,708.
elder trust, Reg.: *See—*
Otto, Friedrich, 3,613,755.
Electromagnetic Industries, Inc.: *See—*
Legatti, Raymond H., 3,614,610.
Elektrodenfabrik Oerlikon Buhrle AG: *See—*
Reinshagen, Kurt, 3,614,604.
Elitex, Zavody textilniho strojirenstvi: *See—*
Havranek, Milan; Zouhar, Drahomir; and Javorek, Jaroslav, 3,613,400.
Ellinger, John H., to Rolls-Royce Limited. Blades or vanes for fluid flow machines. 3,614,260, Cl. 416-23.
Ellis Corporation: *See—*
Toth, Alex, 3,613,406.
Ellis, David W., to Collins Radio Company. Multi-position magnetically held fail-safe switch. 3,614,686, Cl. 335-167.
Ellsworth, James P.; and Flick, Robert H., to Westinghouse Electric Corporation. Circuit breaker with handle indicating means. 3,614,685, Cl. 335-166.
Elmer, Adam. Hydraulic accumulator with floating piston. 3,613,734, Cl. 138-31.
Elmwood Sensors, Inc.: *See—*
Vargas, Walter S., 3,614,702.
Elox Inc.: *See—*
Lobur, Walter, 3,614,368.
Ely, John E. Combination see-saw and carrousel. 3,614,096, Cl. 272-30.
Ely, William Edwin; and Main, Ralph R., to Goodrich, B. F., Company, The. Segmented friction member for brake or clutch. 3,613,851, Cl. 192-107.
Emerson Electric Co.: *See—*
Lauck, William A., 3,613,236.
Reinert, Owen E., 3,614,569.
Emerson, Fred C.: *See—*
Wilska, John E.; Felix, Harold F.; Dialessi, John A.; and Emerson, Fred C.,3,613,657.
Emery, A. H., Company, The: *See—*
Bradley, Chester D.; and Tate, Malcolm C., 3,613,517.
Empire Stove Company: *See—*
Hodges, Ralph R., 3,614,144.
Endres, Dan D.; and Carter, Ronald D., to Kimberly-Clark Corporation. General purpose disposable obsterical and surgical leggings. 3,613,676, Cl. 128-132.
Energy Sciences Incorporated: *See—*
Hughes, Nathaniel, 3,613,722.
Engbert, Reiner: *See—*
Ehlbeck, Heinz-Wilhelm; and Engbert, Reiner,3,614,468.
Engeler, William E.; and Garfinkel, Marvin, to General Electric Company. Electromechanical filters with integral piezo- resistive output and methods of making same. 3,614,678, Cl. 333-72.
Enshu Limited: *See—*
Sakamoto, Toemon, 3,613,743.
Erdmann, Hans, to Industrial Electronic Hardware Corporation. Rotary vane pump. 3,614,276, Cl. 418-238.
E.R.F. Engineering Limited: *See—*
Kennerley, Cyril, 3,613,163.
Erickson, Neil R.: *See—*
Drake, Lewis R.; and Erickson, Neil R.,3,613,436.
Erik Olsson AG: *See—*
Bieri, Hans, 3,613,771.
Ermakov, Ivan Semenovich: *See—*
Mesheingisser, Mikhail Yakovlevich; Ermakov, Ivan Semenovich; Kochkin, Georgy Mikhailovich; Stankun, Alexandr Viktorovich; Shakhov, Filipp Nikolaevich; Velednitsky, Ilya Pinkhusovich; and Yagodin, Petr Petrovich,3,613,563.
Esau, Norman D., to Standard Oil Company. Apparatus for fuel efficiency testing. 3,613,438, Cl. 73-113.
Eshleman, Dean B.; and D'Entremont, Alice M., to Control Data Corporation. Pulse synchronization for digital to analog converters. 3,614,776, Cl. 340-347.
Eskridge, Marshall: *See—*
Willson, James K. V.; and Eskridge, Marshall,3,613,664.
Essex International, Inc.: *See—*
Taormina, Anthony J.; and Witek, Roman J., Jr., 3,614,712.
Esso Research and Engineering Company: *See—*
Crawford, Harry M., 3,614,230.
Grail, Thomas J., 3,614,299.
Esso-Research and Engineering Company: *See—*
Caldwell, Donald A., 3,614,433.
Estep, Everett C. Ladder scaffold. 3,613,831, Cl. 182-27.
Etablissements D.F.: *See—*
Muller, Roger, 3,613,565.
Etablissments Bertrand Faure: *See—*
Christin, George, 3,614,159.
Eten, Richard L., to Carborundum Company, The. Serrated contact wheel. 3,613,316, Cl. 51-141.
Eto, Kunihiko, to Toyoda Koki Kabushiki Kaisha. Pulse motor drive systems. 3,614,580, Cl. 318-696.
Evans, Clarton F., to International Paper Company. Flexible sheet cover material for an open-topped vehicle. 3,614,154, Cl. 296-137.
Evans, George S., to Westinghouse Electric Corporation. Electric discharge lamp having improved mecury- vapor control assembly. 3,614,506, Cl. 313-174.
Evans, Norman: *See—*
Watkin, Brian L. H.; Evans, Norman; and Arnold, Ronald J. K.,3,614,408.
Evans Products Company: *See—*
Wolak, Norbert S.; Wolak, Thomas J.; and Ceyer, Alfons W., 3,613,312.
Evans, Thomas H. Storage case for articles such as tape cartridges. 3,613,871, Cl. 206-1.
Evans, William E.: *See—*
McKinley, Larry E.; and Evans, William E.,3,613,621.

Evdokimov, Jury Pavlovich: *See—*
Belopolsky, Anatoly Ovseevich; Evdokimov, Jury Pavlovich; Vexelman, Garald Lvovich; Nikolsky, Gennady Georgievich; and Pchelin, Vitaly Pavlovich,3,613,256.
Evenson, Arthur Edward. Device for locating heavenly bodies. 3,613,249, Cl. 33-61.
Everett, Robert A. Aerial toy. 3,613,295, Cl. 46-74.
Evitts, James C., Jr.: *See—*
Ruthenberg, Ross E.; and Evitts, James C., Jr.,3,614,470.
Evrard, Robert, to U.S. Philips Corporation. Ionizing device. 3,614,512, Cl. 313-230.
Eyelet Specialty Company: *See—*
Landen, William James, 3,613,928.
Ezaki, Shingo: *See—*
Ito, Saburo; and Ezaki, Shingo,3,614,508.
Fairbanks, Theodore H., to FMC Corporation. Apparatus for continuously extruding net-like structures composed of twisted multifilament yarns. 3,613,161, Cl. 18-12.
Fairchild Hiller Corporation: *See—*
Townsend, Richard E., 3,614,034.
Falconi, G., & C., S.p.A.: *See—*
Vizzotto, Raffaello, 3,613,835.
Fansteel Inc.: *See—*
Holzl, Robert A.; and Koenig, William D., 3,613,766.
Fardeau, Joseph A.: *See—*
Haythornthwaite, James; and Fardeau, Joseph A.,3,613,176.
Farnett, Edward Charles; and Upton, Lee Oliver, Jr., to RCA Corporation. Maximum length pulse sequence generators. 3,614,400, Cl. 235-152.
Farrand, William A., to North American Rockwell Corporation. Package for an electronic assembly. 3,614,541, Cl. 317-101.
Farrell, Alfred J. Combined steering, shift and throttle control for outboard, inboard, or inboard-outboard powered boats. 3,613,632, Cl. 115-18.
Favary, Ethelbert. Shock absorbing vehicle buffer. 3,614,148, Cl. 293-72.
Fecker, Josef, to Texpatent GmbH. Method and apparatus for knitting ladder-proof tubular products. 3,613,399, Cl. 66-55.
Feder, Hubert C. Coincident display arrangement and presentation of difficulty differentiated programmed instruction. 3,613,262, Cl. 35-8.
Federal-Mogul Corporation: *See—*
Berens, Alfred S.; Bainard, Dean R.; and Corsi, George L., 3,614,183.
Federline, Calvin W. Universal joint. 3,613,394, Cl. 64-7.
Fehder, Barry Joel: *See—*
Franklin, David Louis; and Fehder, Barry Joel,3,614,553.
Feldman, Karl T., Jr., to Northrop Corporation. Flat palte heat pipe with structural wicks. 3,613,778, Cl. 165-105.
Felix, Harold F.: *See—*
Wilska, John E.; Felix, Harold F.; Dialessi, John A.; and Emerson, Fred C.,3,613,657.
Felmann, Frederick W.: *See—*
Hill, Rodney S.; Urion, Kenard E.; and Felmann, Frederick W.,3,613,114.
Felton, Herman R., to Du Pont de Nemours, E. I., and Company. Split stream flow cell for analyzing a fluid. 3,614,452, Cl. 250-218.
Fernandez, Arthur; and Humphrey, David H., to Orbit International, Inc. Panel post joining means. 3,613,329, Cl. 52-582.
Fernseh GmbH: *See—*
Krause, Gerhard, 3,614,303.
Schonfelder, Helmut, 3,614,304.
Ferranti, Limited: *See—*
Paulden, Robert Stewart, 3,614,595.
Fi-Shock, Inc.: *See—*
Boyd, A C., 3,614,293.
Fibra-Sonics, Inc.: *See—*
Murry, Edward J., 3,614,069.
Fiedorowicz, John J.; and Lamonde, Romeo L., to United Aircraft Corporation. Strand impregnation apparatus. 3,613,634, Cl. 118-50.
Field, Frank Howard. Spring cushioning device for clustered cylinder lifts. 3,613,516, Cl. 92-85.
Field, Frank Howard. Elevator lift. 3,613,834, Cl. 187-17.
Figlewicz, Raymond C.; and Rennick, John L., to Zenith Radio Corporation. Cathode ray tube magnetic shield. 3,614,519, Cl. 315-8.
Fikse, Tyman H., to Robbins, James S., and Associates, Inc. Tunneling shield with breasting doors. 3,613,383, Cl. 61-85.
Filler, I. J., Enterprises, Inc.: *See—*
Filler, Isadore J., 3,613,897.
Filler, Isadore J., to Filler, I. J., Enterprises, Inc. Spring clip rack. 3,613,897, Cl. 211-120.
Finch, Steven R.: *See—*
Probert, Walter L.; and Finch, Steven R.,3,614,397.
Fincor, Inc.: *See—*
Bucek, Jiri B.; and Shultz, James R., 3,614,616.
Findlay, Jack B.: *See—*
Pool, Stuart D.; Meitl, Harold G.; Rickerd, Calvin P.; Middlesworth, Tommy A.; Findlay, Jack B.; Thayer, Arlie J.; and Svereika, Edward,3,613,342.
Finley, Wallace R.: *See—*
United States of America,National Aeronautics and Space Administration, Administrator, 3,614,772.
Finnegan, Walter D., to Kaiser Aluminum & Chemical Corporation. Method of forming transition insert material. 3,613,220, Cl. 29-472.1
Firestone Tire & Rubber Company, The: *See—*
Smith, Robert C., 3,614,682.
Fischer, Berthold: *See—*
Hoheisel, Rainer; Fischer, Berthold; and Ackermann, Gunter,3,613,716.
Fisher, Everett H., to Western Electric Company, Incorporated. Method of manufacturing piece parts. 3,613,219, Cl. 29-423.
Fisher, Julian Vernon, to Illinois Tool Works Inc. Plastic clip device. 3,613,178, Cl. 24-73.
Fister, Aloysius J., to McGraw-Edison Company. Protector for electric circuits. 3,614,699, Cl. 337-244.
Fitzgerald, Leo E.: *See—*
Seberg, Harold A.; and Fitzgerald, Leo E.,3,613,208.
Fitzpatrick, John R., to Wheatley, Charles, Company. Ceramic gate valve. 3,614,061, Cl. 251-327.
Fitzpatrick, Richard D.: *See—*
Fitzpatrick, Richard; Fitzpatrick, Richard D.; and Balch, William,3,613,251.
Fitzpatrick, Richard; Fitzpatrick, Richard D.; and Balch, William, to Quint Machine Corporation. Hand held bearing compass. 3,613,251, .Cl. 33-72.
Flamm, James R. Equipment deck and ramp. 3,613,920, Cl. 214-85.
Flanigan, David A.: *See—*
Schwarz, William W.; Flanigan, David A.; and Aycock, William C.,3,613,434.
Flaschar, Heinz; Weigert, Wilhelm; Werner, Walter; and Kramer, Manfred, to Bosch, Robert, G.m.b.H. Electrohydraulic remote control arrangement for hydraulic directional valves. 3,613,509, Cl. 91-459.
Flecher, Albert. Slide bolt. 3,613,244, Cl. 32-5.
Fleischer, Leonard R.: *See—*
Tobin, Joseph M.; Tauson, Peter O.; Fleischer, Leonard R.; and Ebner, Harry F.,3,613,655.
Fletcher, Agnes Marion: *See—*
Fletcher, Henry R.,3,613,763.
Fletcher, Henry R., deceased0 (by Fletcher, Agnes Marion; legal representative), to Dunlop Holdings Limited. Pneumatic tires. 3,613,763, Cl. 152-359.
Fletcher, Martin W., to Itek Corporation, mesne. Switchable and modulatory crystal oscillator. 3,614,667, Cl. 332-26.
Fleury, Jacques, to Societe Anonyme Automobiles Citroen. Road vehicle lighting equipment. 3,614,416, Cl. 240-8.25
Flick, Robert H.: *See—*
Ellsworth, James P.; and Flick, Robert H.,3,614,685.
Fluke, Jefferson M.: *See—*
Kaiser, Arthur E.; and Fluke, Jefferson M.,3,613,936.
Flynn, Mchael J.: *See—*
Podvin, Albert; and Flynn, Mchael J.,3,614,745.
FMC Corporation: *See—*
Bunnelle, Philip R., 3,613,808.
Cayton, David W.; and Malley, William G., 3,613,796.
Fairbanks, Theodore H., 3,613,161.
Reimers, James L., 3,613,551.
Reimers, James L., 3,613,865.
Weir, Stanley M., 3,613,910.
Foerster, Roy P., to Bunker-Ramo Corporation, The. Analog-to-digital converter. 3,614,777, Cl. 340-347.
Fogelsong, Robert E.: *See—*
Wright, Colin S.; Fogelsong, Robert E.; Johnson, Jerold W.; and Jouhal, Teja S.,3,613,556.
Folivorov, Vladimir Kikhailovich; Ukraintsev, Boris Nikolaevich; Sirotenko, Georgievich; Tinte, Aivar Eduardovich; Birger, Boris Lvovich; Vilnitis, Aivar Yanovich; Nadezhnikov, Nikita Mikhailovich; and Grinshteen, Mark Ilich. Device for mixing conductive liquids with reagents. 3,614,080, Cl. 266-34.
Forbes, Arthur Stuart: *See—*
Diprose, Kenneth Victor; and Forbes, Arthur Stuart,3,614,448.
Ford, David E., Jr.; and Waltz, Richard W., to Allen-Bradley Company. Controlled rectifier firing circuit. 3,614,596, Cl. 323-2.
Ford, Francis L. Rollaway fence gate. 3,613,314, Cl. 49-425.
Ford Motor Company: *See—*
Baumgartl, Paul, 3,613,474.
Borneman, Karl J., 3,613,479.
Bozoian, Michael, 3,613,820.
Bozoian, Michael, 3,614,730.
Ciampa, Fred A.; and Mazzola, Sergio J., 3,614,266.
Glance, Patrick M., 3,614,127.
Lapinski, Charles W., 3,613,481.
Pierce, Stanley L.; and Winn, William C., 3,613,484.
Sobkow, William J., 3,614,128.
Sobkow, William J., 3,614,129.
Forest City Foam Products, Inc.: *See—*
Moody, Elvin C., 3,613,761.
Forgflo Corporation: *See—*
Coleman, John W., 3,614,520.
Forse, Harry D. Shirt press. 3,613,969, Cl. 223-57.
Forse, Harry D. Bicycle. 3,614,130, Cl. 280-261.
Forster, Klaus W.; and Schaper, Donald W., to Kerma Corporation. Articulated carriage tilting dumping vehicle. 3,613,602, Cl. 105-261.
Forsvarets Fabriksverk: *See—*
Edlund, Ulf, 3,613,588.
Walde, Erik, 3,613,596.

Forth, Murray W., to Deere & Company. Material compressing machine. 3,613,335, Cl. 56-1.

Foster, Jimmie L., to Collins Radio Company. Conversion principle - angle of attack to airspeed. 3,614,036, Cl. 244-77.

Foster Wheeler Corporation: *See—*
Barratt, Robert O., 3,613,643.
Barratt, Robert O., 3,613,781.

Fournier, Gerald R.; and Baker, Charles E., to Texas Instruments, Incorporated. Light beam deflection. 3,614,312, Cl. 178-7.3

Fournier, Jacques Maurice Armand, to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation. Method of multiplication of electric signals and its application to radar or like systems. 3,614,407, Cl. 235-181.

Fowler, Fred N. Educational game. 3,613,268, Cl. 35-31.

Fowler, John H., Jr. Lift device with a pivotal elevator platform. 3,613,917, Cl. 214-75.

Fox, Daniel W. Dental hygiene unit. 3,613,698, Cl. 132-84.

Foxboro Company, The: *See—*
Blaiklock, Paul M., 3,613,709.

Frampton, John Michael: *See—*
Mauger, Roy Harold; and Frampton, John Michael,3,614,735.

Frank, Paul B.; Mangan, Thomas R., Sr.; and McFall, John C., to Eastman Kodak Company. Mixing apparatus. 3,613,714, Cl. 137-263.

Frank, Rudolf: *See—*
Witzig, Emil Karl; and Frank, Rudolf,3,614,251.

Franke, August L. Compressed fabric material with carrying bag. 3,613,875, Cl. 206-47.

Franke, Horst; and Dobler, Erich, to Bosch, Robert, G.m.b.H. Fuel injection pump for internal combustion engines. 3,614,270, Cl. 417-293.

Franklin, David Louis; and Fehder, Barry Joel, to RCA Corporation. Power transistors having controlled emitter impurity concentrations. 3,614,553, Cl. 317-235.

Frazer, Richard A.: *See—*
Brandts, Conrad W.; Stemple, Eugene P.; and Frazer, Richard A.,3,614,240.

Freed, Jacob B.; and Disbrow, Donald R., to Union Pump Company. Sleeved plug valve. 3,614,060, Cl. 251-317.

French, John M.: *See—*
Hill, Robert Curtis; French, John M.; and Toepfer, Richard E.,3,614,450.

Frendreis, James A.: *See—*
Hayes, Robert A.; and Frendreis, James A.,3,613,609.

Freudenberg, Carl: *See—*
Brehm, Hans, 3,613,635.

Frey, Langdon T., III, to General Electric Company. Liquid cooling of electrical apparatus. 3,614,693, Cl. 336-58.

Friebe, Edward A.: *See—*
Behr, Raymond D.; Friebe, Edward A.; and Brandow, Earl E.,3,613,524.

Fried. Krupp Gesellschaft mit beschrankter Haftung: *See—*
Ehle, Joachim, 3,613,939.

Friedlander, Jeffrey J.: *See—*
Tuchinsky, Benjamin; Stein, David Howard; and Friedlander, Jeffrey J.,3,613,280.

Friese, Karl E., to IMC Magnetics Corporation. Bearing seal means for an electrically driven fan. 3,614,261, Cl. 416-174.

Frigitronics of Connecticut, Inc.: *See—*
Crump, Ralph E.; Reynolds, Frank L.; and Tillstrom, Carl R., 3,613,689.

Fritts, Robert W., to Minnesota Mining and Manufacturing Company. Changeable highway sign and motorist aid system. 3,614,727, Cl. 340-22.

Frobel, Artur: *See—*
Thevis, Paul; Frobel, Artur; and Stoll, Oskar,3,613,857.

Froebe, Ronald L., to Bourns, Inc. Miniature potentiometer with friction wheel drive. 3,614,703, Cl. 338-174.

Frost, David A., to Eastman Kodak Company. Photographic film pack. 3,613,537, Cl. 95-13.

Frost, Emerson L., to United States of America, Army. Power conversion system. 3,614,581, Cl. 320-6.

Froumajou, Armand, to Automobiles Peugeot, and Regie Nationale des Usines Renault. Accessory unit for an engine of a vehicle and an engine equipped with said unit. 3,613,645, Cl. 123-41.46

Fruehauf Corporation: *See—*
Tantlinger, Keith W.; and Sweda, Adam D., 3,614,153.

Fuhring, Heinrich; and Sieber, Johannes Helmut, to Bowe, Bohler & Weber KG, firma. Cleaning system using volatile solvents and method of reducing solvent losses therein. 3,613,135, Cl. 8-158.

Fujii, Tatsuo; and Watano, Yutaka, to Nippon Kogaku K.K. Sliding member and electrodes for measuring instruments. 3,614,704, Cl. 338-140.

Fujimoto, Kyohei; and Suyama, Nobuyuki, to Matsushita Electric Industrial Co., Ltd. Vehicle detecting apparatus using electromagnetic wave. 3,614,729, Cl. 340-38.

Fujimoto, Sakae, to Kabushiki Kaisha Ricoh. Response recording device. 3,613,269, Cl. 35-48.

Fujita, Rokuro: *See—*
Koike, Hiroshi; and Fujita, Rokuro,3,614,354.

Fujita, Teizo. Cam switch unit. 3,614,363, Cl. 200-168.

Fujiyasu, Tatsuo; and Hara, Kouichi, to Hitachi, Ltd. Apparatus for simultaneously displaying a plurality of images of an object being analyzed in an electron beam device. 3,614,311, Cl. 178-6.8

Fukatsu, Akihiro; and Yokohama, Kato, to Tokyo Shibaura Electric Co., Ltd. Packaged magnetron. 3,614,505, Cl. 313-153.

Fukatsu, Motonori: *See—*
Iwai, Katsuyuki; Fukatsu, Motonori; and Sato, Fujio,3,614,308.

Fukuoka, Tatsuo. Footwear. 3,613,272, Cl. 36-2.5

Fulton, Langdon Hollister, to RCA Corporation. Squeeze film bearing servo system. 3,614,579, Cl. 318-676.

Furtaw, Clayton C., to Black and Decker Manufacturing Company, The. Lawn mower handle mounting assembly. 3,613,338, Cl. 56-10.1

G & H Products, Inc.: *See—*
Welch, Elmer Scott, 3,613,720.

Gabor, Laszlo, to Nikex Nehezipari Kulkereskedelmi Vallalat. Method and apparatus for burning liquid fuels. 3,614,282, Cl. 431-328.

Gabrys, Alfred E., to CCI Aerospace Corporation. Variable geometry, rotary valve, speed controlled turbine. 3,614,254, Cl. 415-36.

Gachot, Jean. Cock with a rotatable plug. 3,614,063, Cl. 251-355.

Gaertner, Robert M. Engine stall anticipation and reaction device. 3,614,253, Cl. 415-23.

Gage, Arthur F., to North American Rockwell Corporation. Apparatus for holding a stationary workpiece in a friction welding machine. 3,613,983, Cl. 228-2.

Gaiduk, Jury Vladimirovich: *See—*
Muchnik, Vladimir Semenovich; Chermensky, German Petrovich; Nikiforov, Mikhail Andreevich; and Gaiduk, Jury Vladimirovich,3,614,271.

Galian, John N.; and Kuryla, Bruce S., to Totel Systems Corporation. Telephone and signaling system. 3,614,325, Cl. 179-2.

Galis, Alex J. Drill rod with dust collecting means. 3,613,807, Cl. 175-209.

Gance, Joseph V.: *See—*
Ganci, Edward; Gance, Joseph V.; and Anderson, Gerald H.,3,614,133.

Ganci, Edward; Gance, Joseph V.; and Anderson, Gerald H. Shopping cart. 3,614,133, Cl. 280-33.99

Garbalizer Corporation of America: *See—*
Brewer, John C., 3,613,562.

Garcia, Emilio C. Apparatus and method of joining tug and barge in ocean push-towing. 3,613,628, Cl. 114-235.

Gardenier, Hugh E. Process and apparatus for cleaning and pumping contaminated industrial gases. 3,613,333, Cl. 55-89.

Gardner, Donald J.: *See—*
Gorzenski, Donald J.; and Gardner, Donald J.; now by judicial change of name,3,614,701.

Gardner, Donald J. Thermally actuated circuit delay switch. 3,614,698, Cl. 337-81.

Gardner, John F.: *See—*
Shah, Dinesh S.; and Gardner, John F.,3,613,637.

Garfein, Mark M., to General Electric Company. Electronic calculator. 3,614,404, Cl. 235-159.

Garfinkel, Marvin: *See—*
Engeler, William E.; and Garfinkel, Marvin,3,614,678.

Gargini, Eric John, to Communications Patents Limited. Echo equalization and chrispening of TV signals without signal demodulation. 3,614,669, Cl. 332-37.

Garin, Paul V.: *See—*
Jaekle, William M.; Garin, Paul V.; Thomford, William E.; Greb, Wallace M.; Udaloff, Nicholas N.; and Peery, Stephen H., Jr.,3,613,914.

Garlock Inc.: *See—*
Bush, Jack A., 3,613,223.

Garrett Corporation, The: *See—*
Howes, Leslie D., 3,613,360.

Garrett, Henry U., to Garrett, Udell, Inc. Gas lift valve and system. 3,613,712, Cl. 137-155.

Garrett, Howard R.: *See—*
Hentges, Ronald L.; and Garrett, Howard R.,3,613,527.

Garrett, Howard R., to Haskon, Inc. Feeding mechanism for a container filling machine. 3,613,331, Cl. 53-266.

Garrett, Udell, Inc.: *See—*
Garrett, Henry U., 3,613,712.

Garten, Ernest. Golf practice device. 3,614,108, Cl. 273-190.

Gaston, Meneglier G., to Alexandre Piq. Sanitary drain siphon. 3,613,713, Cl. 137-216.2

Gaudry, Paul E.: *See—*
Descarries, Raymond; Gaudry, Paul E.; and Ohlson, B. Erik,3,614,705.

Gawlick, Heinz; Marondel, Gunther; Bendler, Hellmut; and Siegelin, Werner, to Dynamit Nobel Aktiengesellschaft. Propagation primer. 3,613,758, Cl. 149-15.

Gebr. Boehler & Co., AG.: *See—*
Holzgruber, Wolfgang; Kleinhagauer, Otmar; and Geltewa, Hermann, 3,614,285.

Gebruder Einfalt, Firma: *See—*
Einfalt, Alfred, 3,613,304.

Geerlings, Petrus Jacobus. Automatic electric hog feeder. 3,613,641, Cl. 119-51.11

Geiger, Bernard, to Societe Alsaciene de Constructions Mecaniques de Mulhouse. Weft-passing device for a shuttleless loom. 3,613,740, Cl. 139-122.

Gejyo, Tetsuo: *See—*
Manabe, Tosikatu; Gejyo, Tetsuo; and Hamura, Yasuzi,3,614,376.

Geller, S. David. Reshapeable boot or shoe and method of reshaping. 3,613,271, Cl. 36-2.5

Geltewa, Hermann: *See—*
Holzgruber, Wolfgang; Kleinhagauer, Otmar; and Geltewa, Hermann,3,614,285.

Gems Company, Inc., The: *See—*
Moore, Edward H.; and Aron, Milton A., 3,614,759.

General American Transportation Corporation: *See—*
Adamski, Maxmilian; and Schover, Donald S., 3,613,564.

General Cable Corporation: *See—*
Marx, Walter H., 3,614,715.

General Electric Company: *See—*
Alter, Henry Ward; and Gilbert, Richard S., 3,614,421.
Chang, Winston H., 3,613,210.
Collings, Harold E.; and Darby, William L., 3,614,493.
Deits, William C.; and Day, Bernard E., 3,614,499.
Dillenbeck, Robert H., 3,614,420.
Eggenberger, Markus A., 3,614,457.
Eichelberger, Charles D.; and Kosich, Lawrence J., 3,614,350.
Engeler, William E.; and Garfinkel, Marvin, 3,614,678.
Frey, Langdon T., III, 3,614,693.
Garfein, Mark M., 3,614,404.
Henderson, Wayne L., 3,613,656.
Hermann, Gerald P., 3,614,358.
Herzog, Josef; and Ryan, Francis D., 3,614,112.
Jones, George B., 3,614,563.
Koch, Albert F., 3,614,571.
Lindsay, Donald S.; and Little, William J., 3,614,473.
May, John E., 3,614,547.
Peil, William; and Pepe, Richard J., 3,614,748.
Rooney, James J. H., 3,614,255.
Smith, Sidney R., Jr.; and Westendorp, Willem F., 3,614,532.
Stetson, Earl W.; and Charewicz, Francis J., 3,614,523.
Usher, Thomas E., 3,614,572.
Volker, Russell E., 3,614,292.

General Machinery Company: *See—*
Shadle, Donald H., 3,614,151.

General Motors Corporation: *See—*
Zeigler, Philip B.; St. Amand, James C.; and Ranft, Ernst L., 3,613,944.

Generoso, Nicomedes S. Safety hull for water craft. 3,613,620, Cl. 114-61.

Genie Grape Harvester, Inc.: *See—*
Sagouspe, Jean; and Riley, Eugene D., 3,613,343.

Gentex Corporation: *See—*
Alleo, Jackson Anthony, 3,613,113.

Geonics Limited: *See—*
Ronka, Vaino, 3,614,600.

George, Kenyon P.; and Siegler, Edouard Horace, Jr., to Cary Instruments. Grating drive mechanism. 3,614,227, Cl. 356-95.

George, William J.: *See—*
Hyde, John W.; and George, William J.,3,613,792.

Gerig, John S., to Reaction Instruments, Incorporated. Frequency stabilization of continuously tunable oscillators. 3,614,649, Cl. 331-17.

Gerrett Corporation, The: *See—*
Mason, John L.; and Greenwood, Robert W., 3,613,782.

Gertler, Eugene I.: *See—*
Huber, George H.; Gertler, Eugene I.; Habgood, Dennis W.; Ciarrocchi, John A.; and Richman, Walter A.,3,614,765.

Geurian, Grady O. Saw chain with dual cutters. 3,613,749, Cl. 143-135.

Gewerkschaft Eisenhutte Westfalia: *See—*
Holken, Norbert; and Sprenger, Gerhard, 3,614,141.

Giambrone, Harry Joseph, to Baxter Laboratories, Inc. Form for elastic gloves. 3,613,172, Cl. 18-41.

Gianatasio, Henry L., to Pres-on Products, Inc. Automotive vehicle windshield and windshield wiper and wiper blade sharpener attachment therefor. 3,613,318, Cl. 51-241.

Giedd, Gary R.; Maley, Gerald A.; and Perkins, Merlyn H., to International Business Machines Corporation. Random number statistical logic test system. 3,614,608, Cl. 324-73.

Giersiepen, Werner. Indicating device. 3,613,352, Cl. 58-50.

Gilbert, Brian, to Lucas, Joseph, (Industries) Limited. Spark ignition systems. 3,613,654, Cl. 123-148.

Gilbert, Richard S.: *See—*
Alter, Henry Ward; and Gilbert, Richard S.,3,614,421.

Gilder, George: *See—*
Noble, Sid; and Gilder, George,3,613,301.

Gilkey, George M.: *See—*
Beck, John J.; and Gilkey, George M.,3,614,359.

Gillemot, George W.: *See—*
Thompson, John T.; and Gillemot, George W.,3,614,298.

Gillemot, George W.; and Thompson, John T. Cable splice kit and method of use in making branchout service connections. 3,614,295, Cl. 174-87.

Gillette Company, The: *See—*
Lotfallah, Lotfi H., 3,614,246.

Gilmont, Roger; and Portyrata, Raymond E., to Cole Parmer Instrument Company. Fluid dispenser with adjustable stroke piston and register. 3,613,952, Cl. 222-43.

Gingerich, Charles L. Article of ornamental wear particularly a neck tie. 3,613,117, Cl. 2-149.

Girling Limited: *See—*
Lawson, Thomas G., 3,614,175.
Newstead, Charles, 3,613,841.

Gladen, Carl F. Hot stamping die structure for hot stamp decorating. 3,613,570, Cl. 101-9.

Glanc, Antonin; and Janovec, Vaclav, to Ceskoslovenska akademie ved. DC voltage inverter. 3,614,482, Cl. 310-8.1

Glance, Patrick M., to Ford Motor Company. Variable pressure air bag restraint device. 3,614,127, Cl. 280-150.

Glass, Dwight W.; and Dauenbaugh, Robert L., to Keystone Consolidated Industries, Inc. Combination latch and locking mechanism. 3,613,413, Cl. 70-298.

Glass, Emmett F.; and Schwalm, Bruce D., to Sperry Rand Corporation. Linkage mechanism actuating hydrostatic transmissions separately driving the front wheels of a tractor. 3,613,817, Cl. 180-6.48

Glass, Marvin, & Associates: *See—*
Morrison, Howard J.; and Glass, Marvin I., 3,614,106.

Glass, Marvin I.: *See—*
Morrison, Howard J.; and Glass, Marvin I.,3,614,106.

Glickman, Richard B., to Berkey/Colortran Mfg., Inc. Bipost socket for luminaires. 3,614,710, Cl. 339-75.

Glinski, Vincent J., to Bell Telephone Laboratories, Incorporated. Monolithic integrated circuit structure. 3,614,555, Cl. 317-235.

Glorioso, Charles A., to Teletype Corporation. Character repeat circuit. 3,614,315, Cl. 178-17.

Glumbmann, Wilhelm. Hair cutting machine. 3,613,234, Cl. 30-31.

Gmuer, Thomas C., to Superior Electric Company, The. Three-phase delta connected voltage regulating system and method therefor. 3,614,599, Cl. 323-44.

Goff, Raymon L., to TRW Inc. Hydrostatic steering system with hydraulic reaction and reaction limiting. 3,613,364, Cl. 60-52.

Goggins, William B., Jr., to United States of America, Air Force. Dual harmonic frequency moving target indicator radar. 3,614,786, Cl. 343-7.7

Goldbach, Gunter: *See—*
Borner, Manfred; and Goldbach, Gunter,3,614,661.

Goldberg, Abraham A., to Columbia Broadcasting System, Inc. Apparatus for recording color information on monochrome film. 3,614,302, Cl. 178-5.2

Goldberg, Joel C.; and Gray, Dudley, to Stewart-Warner Corporation. Enabling means for a paper cutter in a facsimile system. 3,614,306, Cl. 178-6.

Goldsborough, John P., to Spectra-Physics, Inc. Gas laser having means for maintaining a uniform gas mixture in a D-C discharge. 3,614,658, Cl. 331-94.5

Goldsmith, Eustace Laurence, to United Kingdom of Great Britain and Northern Ireland, Minister of Technology in Her Britannic Majesty's Government of the. Aircraft engine intake structures. 3,613,704, Cl. 137-15.2

Goldstern, Norbert F. Registration record and method for reading it. 3,614,396, Cl. 235-61.12

Gomann, Jurgen, to Hauni-Werke Koerber & Co., KG. Apparatus for building a continuous tobacco stream. 3,613,692, Cl. 131-84.

Goodacre, Cecil: *See—*
Payne, Ivan Salisbury; and Goodacre, Cecil,3,614,567.

Goodell, Stuart E.; and Stoeckinger, Gerald R., to McDonnell Douglas Corporation. Fluxless high frequency aluminum tube welding without inserts. 3,614,378, Cl. 219-137.

Goodman, Richard E. Vapor dispensing device. 3,613,994, Cl. 239-44.

Goodrich, B. F., Company, The: *See—*
Ely, William Edwin; and Main, Ralph R., 3,613,851.

Goodsite, James R., to Westvaco Corporation. Corner post. 3,613,985, Cl. 229-14.

Goodwin, Robert Lewis: *See—*
Kang, George Su; and Goodwin, Robert Lewis,3,614,673.

Goodyear Aerospace Corporation: *See—*
Buynak, George R.; Diamantides, Nicholas D.; and Smith, Richard H., 3,614,035.

Gordon, Bernard M., to Gordon Engineering Company. Indicator glow tube. 3,614,773, Cl. 340-343.

Gordon Engineering Company: *See—*
Gordon, Bernard M., 3,614,773.

Gores, Kenneth W., to Kirkman Laboratories, Inc. Work area illuminator. 3,614,414, Cl. 240-2.

Gorike, Rudolf, to Akustische u. Kino-Gerate Gesellschaft m.b.H. Earphone assembly with resiliently retained transducer. 3,614,344, Cl. 179-182.

Gorsuch, Reynolds G. Sampling means for exhaled air. 3,613,665, Cl. 128-2.

Gorzenski, Donald J.; and Gardner, Donald J.; now by judicial change of name. Manually controlled delayed action power switch. 3,614,701, Cl. 337-341.

Gosudarstvenny nauchno-issledovatelsky institut oteploenergeticheskogo priborostroenia: *See—*
Yalyshev, Aly Umyarocivh; Svecharnik, David Veniaminovich; Pavlenko, Vladimir Alexandrovich; Tsarkov, Vyacheslav Alexeevich; Bonch-Bruevich, Andrei Mikhailovich; and Levinson, Boris Alexandrovich, 3,614,633.

Gourdine, Meredith C.; Collier, Edward L.; Lewis, Gerald P.; Mc Crae, Harold; and Port, Donald H., to Gowudine Systems, Inc. Electrostatic painting method and apparatus. 3,613,993, Cl. 239-3.

Gower, Roger L. Connector devices. 3,613,355, Cl. 59-93.

Gowudine Systems, Inc.: *See—*
Gourdine, Meredith C.; Collier, Edward L.; Lewis, Gerald P.; Mc Crae, Harold; and Port, Donald H., 3,613,993.

Graber, Homer R.: *See—*
Krehbiel, Robert D.; and Graber, Homer R.,3,613,508.

Graco Inc.: *See—*
Wiese, Richard V., 3,614,352.

Graham, David E. Hat toy. 3,613,294, Cl. 46-51.

Graham, Geoffrey P., to Societe Rhodiaceta. Apparatus and method for treating moving yarns with a liquid. 3,613,407, Cl. 68-202.

Graham, Robert R.; Siegel, Keeve M.; and Vivian, Weston E., to Conductron Corporation. Fine resolution radar for foliage penetration. 3,614,778, Cl. 343-5.

Grail, Thomas J., to Esso Research and Engineering Company. Low thermal conductivity cable core wrap. 3,614,299, Cl. 174-107.

Granderath, Robert. Buoyant cover for a swimming pool. 3,613,126, Cl. 4-172.14

Graphic Sciences, Inc.: *See—*
Krallinger, Robert E.; Keplinger, Edward G.; and Terrell, Jerry W., 3,614,319.

Gravez, Andre: *See—*
Carlier, Claude; and Gravez, Andre,3,613,927.

Gray, Dudley: *See—*
Goldberg, Joel C.; and Gray, Dudley,3,614,306.

Greb, Wallace M.: *See—*
Jaekle, William M.; Garin, Paul V.; Thomford, William E.; Greb, Wallace M.; Udaloff, Nicholas N.; and Peery, Stephen H., Jr.,3,613,914.

Green, Charles J., to Vashon Industries, Inc. Toy aircraft with pressurized fluid propulsion system. 3,613,296, Cl. 46-76.

Green, Donald T., to Picker Corporation. Method and apparatus for inspecting ply splices of tires by means of X-rays. 3,614,432, Cl. 250-52.

Greenhalgh, William. Reusable forming unit. 3,614,050, Cl. 249-26.

Greenwald, Harry; and Larkin, Dennis J., to Greenwald Industries, Inc. Selectively variable coin control apparatus. 3,614,681, Cl. 335-140.

Greenwald Industries, Inc.: *See—*
Greenwald, Harry; and Larkin, Dennis J., 3,614,681.

Greenwood & Batley Ltd.: *See—*
Loughran, Anthony, 3,613,567.

Greenwood, Robert W.: *See—*
Mason, John L.; and Greenwood, Robert W.,3,613,782.

Gregory, Joseph E. Three dimensional space game. 3,614,104, Cl. 273-134.

Grein, Thomas E., to Berkley & Company, Inc. Glass ferrule with external sleeve. 3,613,287, Cl. 43-18.

Gretchikhine, Nicolas, to Societe Ormig. Selective-transfer printing machine. 3,613,572, Cl. 101-91.

Griff, William, to Bunker Ramo Corporation, The. Method of fabricating coaxial circuitry. 3,613,230, Cl. 29-624.

Griffin, Phil H., III: *See—*
Rehm, William A.; Griffin, Phil H., III; and Sharki, Martin J.,3,614,761.

Grim, James W.: *See—*
Adamski, Joseph; and Grim, James W.,3,614,065.

Grinshteen, Mark Ilich: *See—*
Folivorov, Vladimir Kikhailovich; Ukraintsev, Boris Nikolaevich; Sirotenko, Georgievich; Tinte, Aivar Eduardovich; Birger, Boris Lvovich; Vilnitis, Aivar Yanovich; Nadezhnikov, Nikita Mikhailovich; and Grinshteen, Mark Ilich,3,614,080.

Gronemeyer, Erich W.; and Kutik, Louis F. Valve and mounting. 3,613,964, Cl. 222-402.24

Gronros, Warren; and Walsh, Edward J., to Bell Telephone Laboratories, Incorporated. Direct-current gaseous optical maser structure. 3,614,654, Cl. 331-94.5

Gross, Anton F.; and Gross, Phyllis M. Feminine hygiene device. 3,613,122, Cl. 4-110.

Gross, Phyllis M.: *See—*
Gross, Anton F.; and Gross, Phyllis M.,3,613,122.

Gross, Thomas A. O. Ground fault responsive electrical protective systems. 3,614,534, Cl. 317-18.

Grove Valve and Regulator Company: *See—*
Connolly, Walter L.; Andree, Harold C.; and Harrison, Ralph M., 3,614,250.

Groves, Arthur Derek George: *See—*
Hesselbo, Torben; and Groves, Arthur Derek George,3,614,443.

Grow, Harry N.; Huempfner, David F.; and Reich, Paul A., to American Hospital Supply Corporation. Adjustable table frame construction. 3,613,606, Cl. 108-153.

Grubel, Stanley J.; and Stirling, Hugh R., to International Business Machines Corporation. Go/no-go times circuit using a tunnel diode to sample a test waveform. 3,614,609, Cl. 324-77.

Gruber, Ernst, to Licentia Patent-Verwaltungs-G.m.b.H. Protective sheath for torpedo control wire. 3,613,618, Cl. 114-21.

Grundy, Reed H., to Westinghouse Air Brake Company. Fail-safe level detector with 50-50 duty cycle. 3,614,466, Cl. 307-202.

Grunwald, Robert F.; Wallace, Richard R.; and Bowen, Howard, to Harwald Company, Inc., The. Testing device for film. 3,613,444, Cl. 73-157.

Guarasci, Mario: *See—*
Hayden, Rodney; and Guarasci, Mario,3,614,770.

Guardian Electric Company: *See—*
Egler, Joseph J., 3,614,684.

Gudaitis, Bernard Vincent; and Loose, Winfield Warren, to AMP Incorporated. Rectilinearly movable switch assembly with particular pivotal actuator and flange means. 3,614,346, Cl. 200-16.

Guenard, Edward Franklin. Hydraulic press with rotatable C-clamp head. 3,613,764, Cl. 157-1.26

Guerrero, Michael Carl; Jutice, Robert Earl; and Rudy, Richard Miller, to RCA Corporation. Apparatus for handling endless tape. 3,613,976, Cl. 226-78.

Guest, Kenneth E.: *See—*
Cholin, Roger R.; and Guest, Kenneth E.,3,613,461.

Gulf & Western Systems Company: *See—*
Beck, John J.; and Gilkey, George M., 3,614,359.
Rieman, Willis E.; and Betz, Edward R., 3,614,573.

Gunn, John B., to International Business Machines Corporation. Sampling system utilizing electro-optic techniques. 3,614,451, Cl. 250-217.

Guntersdorfer, Max, to Siemens Aktiengesellschaft. Barrier-free semiconductor switching device. 3,614,559, Cl. 317-238.

Gunther, Karl-Georg, to Siemens Aktiengesellschaft. Ionization getter pump. 3,614,264, Cl. 417-49.

Gurkin, David E. Self-cleaning device for rotary television set tubes. 3,613,149, Cl. 15-256.51

Guse, Rudolf: *See—*
Schenk, Horst; Wetter, Jakob; and Guse, Rudolf,3,613,432.

Gutbrod, Walter. Self-propelled multi-purpose vehicle. 3,613,816, Cl. 180-53.

Gutowski, Chester L.: *See—*
Smith, Richard A.; and Gutowski, Chester L.,3,613,746.

Habgood, Dennis W.: *See—*
Huber, George H.; Gertler, Eugene I.; Habgood, Dennis W.; Ciarrocchi, John A.; and Richman, Walter A.,3,614,765.

Hacker, Edward W. Incinerator or similar article. 3,613,607, Cl. 110-18.

Hacker, George A., to Lott, H. A., Inc. Concrete shaper apparatus. 3,613,185, Cl. 25-118.

Haddon, Roger C., to Alluminum Company of America. Forming die structure. 3,613,427, Cl. 72-212.

Haffner, Donald G.: *See—*
Akgulian, Sahag C.; Haffner, Donald G.; and Heth, Sherman C.,3,613,337.
Akgulian, Sahag C.; Haffner, Donald G.; and Heth, Sherman C.,3,613,340.

Hahn, Larry Alan, to Texas Instruments, Incorporated. Semiconductor power switching apparatus. 3,614,474, Cl. 307-252.

Haines, Kenneth A., to Holotron Corporation. Undistorted image demagnification by holographic information sampling. 3,614,190, Cl. 350-3.5

Haisty, Robert W.; Johnson, Rowland E.; and Mehal, Edward W., to Texas Instruments, Incorporated. Three-dimensional integrated circuits and methods of making same. 3,613,226, Cl. 29-577.

Haldemann, Gaston, to Haldemann S.A. Ski. 3,614,116, Cl. 280-11.13

Haldemann, Paul R.: *See—*
Hochuli, Urs; and Haldemann, Paul R.,3,614,642.

Haldemann S.A.: *See—*
Haldemann, Gaston, 3,614,116.

Hale, David A.; and Housman, Earl R. Antitheft device. 3,614,460, Cl. 307-10.

Halinski, Michael J.; and Wanschek, Larry, to Sun Electric Corporation. Circuit for automatically selecting one of two synchronizing pulse sources. 3,614,522, Cl. 315-26.

Hall, Herbert Lynwood. Structural system for walls or ceilings or decks. 3,613,327, Cl. 52-489.

Hall, William B.; and Block, Fred G., to RCA Corporation. Constant temperature output heat pipe. 3,613,773, Cl. 165-32.

Hallenbeck, Bennett, to Sybron Corporation. Intrinsically safe system including electrical barrier with external connectors. 3,614,539, Cl. 317-99.

Halley, Angus Murray, to Halley, James, & Sons Limited. Rotary web processing machines. 3,613,577, Cl. 101-247.

Halley, James, & Sons Limited: *See—*
Halley, Angus Murray, 3,613,577.

Halliday, Robert B. Electrostatic generator. 3,614,481, Cl. 310-6.

Halligan, Dewey D. Elevated automobile brake light on spring mount. 3,614,733, Cl. 340-87.

Halpin, Joseph J.; and Wenzel, Richard F., to United States of America, Navy. Dosimeter for pulsed ionizing radiation. 3,614,435, Cl. 250-71.5

Hamano, Goro; and Someda, Sadamichi, to Matsushita Electric Industrial Co., Ltd. Number entry system. 3,614,405, Cl. 235-160.

Hamilton Watch Company: *See—*
Walton, Richard S., 3,613,351.

Hamisch, Hansjoachim, to Bosch, Robert, G.m.b.H. Apparatus for maintaining a recording radiation spot on a record carrier. 3,614,456, Cl. 250-234.

Hammond, James T., to Caterpillar Tractor Company. One way clutch for governors. 3,613,460, Cl. 73-543.

Hamura, Yasuzi: *See—*
Manabe, Tosikatu; Gejyo, Tetsuo; and Hamura, Yasuzi,3,614,376.

Hancock & Co., (Engineers) Limited: *See—*
Diprose, Kenneth Victor; and Forbes, Arthur Stuart, 3,614,448.

Hancock, Allan C. W. Folding mobile shelters. 3,614,152, Cl. 296-23.

Hansen, Earl T., to Sperry Rand Corporation. Photomultiplier tube AGC using photoemitter- sensor for dynode biasing. 3,614,646, Cl. 330-59.

Hansen, Gunnar Lyshoj: *See—*
Borchers, Alwin; Sjotun, Kyrre Guttorm; Hansen, Gunnar Lyshoj; and Clausen, Jorgen Rono,3,614,494.

Hansgen, Klaus; Kinzler, Fritz; and Spohr, Hans Werner, to Mannesmann Aktiengesellschaft, Firma. Self-propelled floating structure. 3,613,139, Cl. 14-27.
Hara, Kouichi: *See—*
Fujiyasu, Tatsuo; and Hara, Kouichi,3,614,311.
Hardinge Brothers Inc.: *See—*
Parsons, Hubert J.; Catlin, Francis D.; and Cordier, James, 3,613,488.
Harmsen, Johan L. Securing means for power rail and/or shield. 3,614,340, Cl. 191-32.
Harnischfeger Corporation: *See—*
Kupsis, Herbert, 3,614,349.
Mierendorf, Robert E., 3,614,565.
Harper, James F.: *See—*
Thresher, Richard G.; Kosar, John P.; and Harper, James F.,3,613,593.
Harris, Clyde W., to Te Company, The. Wide field optical scanner. 3,614,194, Cl. 350-7.
Harris, Dwight M.: *See—*
Mulhern, John E., Jr.; and Harris, Dwight M.,3,614,343.
Harris, W. Leslie, to Contra Costa County Water District. Filter backwashing method. 3,613,888, Cl. 210-80.
Harris-Intertype Corporation: *See—*
Kolb, Edwin R.; and Drake, Herbert E., 3,614,764.
Perkins, Howard R., 3,613,217.
Harrison, George; and Harrison, Nelson K. Method and apparatus for melting metal chips. 3,614,079, Cl. 266-33.
Harrison, James E., to Trojan, Inc. Well casing stop collar. 3,614,139, Cl. 287-52.
Harrison, Nelson K.: *See—*
Harrison, George; and Harrison, Nelson K.,3,614,079.
Harrison, Ralph M.: *See—*
Connolly, Walter L.; Andree, Harold C.; and Harrison, Ralph M.,3,614,250.
Harsco Corporation: *See—*
Arndt, Charles J., 3,613,866.
Harshman, Everett E., to National Cash Register Company, The. High density static card reader. 3,614,395, Cl. 235-61.11
Hart, Gerald E., to United States of America, Navy. Pressure responsive timing device. 3,614,348, Cl. 200-33.
Hart, Gerald E. Signal display system. 3,614,787, Cl. 343-11.
Hart, Joseph W., to Burroughs Corporation. Associative thin film memory organization. 3,614,755, Cl. 340-174.
Hartco Company: *See—*
Langas, Arthur; and Lingle, Harrison C., 3,613,878.
Harter, Donald G., to White Consolidated Industries, Inc. Head pressure control system. 3,613,391, Cl. 62-184.
Harter, Mary C.: *See—*
Mighton, Perciptimus J., 3,613,320.
Hartley, Richard S., to Hobart Manufacturing Company, The. Food slicing machine. 3,613,754, Cl. 146-102.
Hartmann, Ernst-Siegfried: *See—*
Mettig, Hermann; Hartmann, Ernst-Siegfried; and Lewin, Georg-Wilhelm,3,613,647.
Harvey, Robert J., 25% to Del Ben, Reno A. Variable path-length gas cell. 3,614,243, Cl. 356-246.
Harvey-Westbury Corporation: *See—*
Eccles, William, 3,613,137.
Harwald Company, Inc., The: *See—*
Grunwald, Robert F.; Wallace, Richard R.; and Bowen, Howard, 3,613,444.
Hasegawa, Hisao; and Sanami, Masashi, to Toyo Bearing Manufacturing Company. Constant velocity ball joint. 3,613,398, Cl. 64-21.
Hasegawa, Seiro; and Matsushima, Hiroshi, to Matsushita Electric Industrial Co., Ltd. Thermoluminescence dosimeter device. 3,614,436, Cl. 250-71.5
Haskon, Inc.: *See—*
Garrett, Howard R., 3,613,331.
Haskon Incorporated: *See—*
Hentges, Ronald L.; and Garrett, Howard R., 3,613,527.
Hatschek, Rudolf A., to Vibro-Meter AG. Piezoelectric accelerometer with baseplate cooling. 3,614,487, Cl. 310-8.4
Hattaway, Dudley P.: *See—*
Bailey, Knight V.; and Hattaway, Dudley P.,3,614,410.
Hattersley, Robert M.: *See—*
Restall, George; and Hattersley, Robert M.,3,613,642.
Hattori, Shuzo, to Nihon Denshi Kabushiki Kaisha. Cylindrical plasma laser. 3,614,657, Cl. 331-94.5
Hauff, Alfred: *See—*
Scheidig, Helmut; Hauff, Alfred; and Reimpell, Uwe,3,614,284.
Hauni-Werke Koerber & Co., KG: *See—*
Gomann, Jurgen, 3,613,692.
Haupt, Karl: *See—*
Stork, Willi; and Haupt, Karl,3,613,529.
Hauser, Raimund: *See—*
Plihal, Hanns; Rothy, Gerhard; and Schild, Josef, 3,613,544.
Havranek, Milan; Zouhar, Drahomir; and Javorek, Jaroslav, to Elitex, Zavody textilniho strojirenstvi. Knitting machines. 3,613,400, Cl. 66-57.
Hawker Siddeley Canada Ltd.: *See—*
Bricknell, William H., 3,613,750.
Hayden, Rodney; and Guarasci, Mario, to TRW Inc. Flasher buzzer device. 3,614,770, Cl. 340-328.
Haydu, John L.; and Coleman, Bernard, to Rowan Controller, Inc. Multi-pole switching mechanism. 3,614,680, Cl. 335-132.
Hayes, Robert A.; and Frendreis, James A., to Union Special Machine Company. Feed mechanism and presser foot arrangement. 3,613,609, Cl. 112-235.
Haythornthwaite, James; and Fardeau, Joseph A., to Scapa Dryers (Canada) Ltd. Slider for separable fasteners. 3,613,176, Cl. 24-31.
Heald Machine Company, The: *See—*
Newton, Robert F.; and Csapo, Tibor J., 3,613,224.
Heath, Clarence Willans, to TRW Inc., mesne. Electric lampholder. 3,614,713, Cl. 339-128.
Heath, Ronald Alfred, to Lucas, Joseph, (Industries) Limited. Fluidic switching circuits. 3,613,705, Cl.
Heath, Ronald Alfred, to Lucas, Joseph, (Industries) Limited. Fluidic switching circuits. 3,613,707, Cl. 137-81.5
Heberlein & Co., AG: *See—*
Dosch, Peter; Heck, Reinhard; and Hubeli, Ernst, 3,613,744.
Heck, Reinhard: *See—*
Dosch, Peter; Heck, Reinhard; and Hubeli, Ernst,3,613,744.
Heckman, Edward A.; Hinkle, James O.; and Walls, Edgar H., to Western Electric Company, Incorporated. Apparatus for gaging the location of contact points of switch-cover assemblies. 3,614,601, Cl. 324-28.
Hedden, Smith E.: *See—*
Brown, William J.; Butler, Robert F.; Hedden, Smith E.; and Jablovskis, Janis,3,613,592.
Hedison Corporation: *See—*
Lamoureux, Roland W., 3,613,393.
Hedley, David Alan: *See—*
Woodhead, James; Hedley, David Alan; and Jardine, Maurice Revie,3,613,573.
Hedrick, Robert R.; and Thomas, Arthur L., 'Automatic' Sprinkler Corporation of America. Induction scheme and automatic loader. 3,613,863, Cl. 198-33.
Heflinger, Lee O., to TRW Inc. Fringe-generating holographic system. 3,614,234, Cl. 356-106.
Hehl, Karl. Clamping unit for molding machines. 3,613,171, Cl. 18-30.
Heightley, John D., to Bell Telephone Laboratories, Incorporated. Shift register employing two-phase coupling and transient storage between stages. 3,614,469, Cl. 307-221.
Heim Universal Corporation: *See—*
Rozentals, Alfreds R., 3,614,182.
Heinz, H. J., Company: *See—*
Smith, Richard A.; and Gutowski, Chester L., 3,613,746.
Heise, Robert H., to International Harvester Company. Wedge-lock collapsible steering column. 3,613,477, Cl. 74-493.
Heitchue, Regis D., Sr., to Westinghouse Electric Corporation. Motor compressor unit with reduced noise transmission. 3,614,384, Cl. 417-312.
Held, Gerhard R. Honing gear assembly. 3,613,472, Cl. 74-411.
Helderman, James F., to U.S. Expansion Bolt Company. Expansion anchor. 3,613,497, Cl. 85-84.
Hellqvist, Ake Oscar Wilhelm, to AB Gustavsbergs Fabriker. Apparatus for biologically purifying sewage. 3,613,890, Cl. 210-150.
Helmick, B. J. Supporting roller assembly for a sliding panel. 3,613,313, Cl. 49-420.
Henderson, Martin C., to Bunker-Ramo Corporation, The. Deflection signal correction system including an analog multiplier. 3,614,411, Cl. 235-194.
Henderson, Richard E.: *See—*
Marshall, James E.; and Henderson, Richard E.,3,614,110.
Henderson, Wayne L., to General Electric Company. Pyrolytic cleaning of double ovens. 3,613,656, Cl. 126-21.
Hendricks, Grover E. Gun cartridge. 3,613,584, Cl. 102-38.
Hendrickson, Philip J.; and Resch, Richard J., to Krueger Metal Products, Inc. Ganging attachment for folding chairs. 3,614,157, Cl. 297-248.
Hennessy Products, Incorporated: *See—*
Wetherill, John H., 3,613,144.
Henriksen, Elmer C., to Bell & Howell Company. Projector for automatically threading, rewinding, and indexing a plurality of film spools and a magazine. 3,614,022, Cl. 242-198.
Henson, Richard C., to Keystone Consolidated Industries, Inc. Hinge construction. 3,613,151, Cl. 16-180.
Hentges, Ronald L.; and Garrett, Howard R., to Haskon Incorporated. Container erecting and holding device. 3,613,527, Cl. 93-53.
Hepler, Ralph M. Plate cutting machine and the like. 3,614,078, Cl. 266-23.
Hepplewhite, Gordon H. Electric water heater. 3,614,386, Cl. 219-312.
Herbenar, Edward J., to TRW Inc. Stamped ball joint assembly and method of making same. 3,613,201, Cl. 29-149.5
Hercules Incorporated: *See—*
King, Elliott L., 3,613,587.
Herger, Zoltan L., to Storage Technology Corporation. Tape rewind speed change system. 3,614,020, Cl. 242-188.
Herman, Sidney: *See—*
Hluchan, Stpehen A.; Herman, Sidney; and Dowd, Eugene G.,3,614,731.
Hermann, Gerald P., to General Electric Company. Oil immersed snap action loadbreak switch. 3,614,358, Cl. 200-150.
Hermes, Heinz; Hinterthur, Helmut; Otto, Arnold; Thieme, Klaus Dietrich; and Westhoff, Heinz, to Licentia Patent-Verwaltungs-G.m.b.H. Aiming arrangement. 3,614,723, Cl. 340-16.

Herren, Donald Gene. Low tire pressure warning system for tandem axle assemblies. 3,614,122, Cl. 280-104.5
Herriott, Donald R.: *See—*
Javan, Ali; Bennett, William R., Jr.; and Herriott, Donald R.,3,614,653.
Herzog, Josef; and Ryan, Francis D., to General Electric Company. Fluid deflector apparatus. 3,614,112, Cl. 277-19.
Hess, Bruno, to Vogele, Joseph, AG. Apparatus for positioning a finishing screed member in a road paving machine. 3,613,530, Cl. 94-46.
Hess, Rudolf: *See—*
Schmidt, Werner; and Hess, Rudolf,3,614,076.
Hesselbo, Torben; and Groves, Arthur Derek George, to Smith Kline & French Laboratories. Spark chambers. 3,614,443, Cl. 250-83.6
Heth, Sherman C.: *See—*
Akgulian, Sahag C.; Haffner, Donald G.; and Heth, Sherman C.,3,613,337.
Akgulian, Sahag C.; Haffner, Donald G.; and Heth, Sherman C.,3,613,340.
Hetteen, Donnelly L.; and Reese, Gerald D., to Textron Inc. Suspension system for tracked vehicles. 3,613,810, Cl. 180-5.
Hetteen, Edgar E., to Arctic Enterprises, Inc. Shock mounted skis for snowmobile. 3,613,812, Cl. 180-5.
Hettich, Alfred: *See—*
Paule, Kurt; Schadlich, Fritz; and Hettich, Alfred,3,613,696.
Hettich, Bernhard: *See—*
Mutz, Gerhard; Hettich, Bernhard; and Moser, Werner,3,614,094.
Hetzel, Marvin E.: *See—*
Cervenka, Joseph J.; and Hetzel, Marvin E.,3,614,718.
Heurich, Charles, to Pamarco Incorporated. Ink metering roll for use intermediate a fountain roll and a printing roll. 3,613,578, Cl. 101-350.
Hewlett-Packard Company: *See—*
Band, Ian T.; and Borden, Howard C., 3,614,771.
Heynick, Louis N.; and Westerberg, Eugene R., to Stanford Research Institute. Charged particle pattern imaging and exposure system. 3,614,423, Cl. 250-49.5
Hickmann, Horst R.: *See—*
Kees, George, Jr.; and Hickmann, Horst R.,3,613,683.
Hidaka, Tsuneyoshi; Morita, Akiyoshi; Honjo, Yoshihiko; and Nishimura, Takashi, to Victor Company of Japan, Limited. Color video signal correction for mechanical variations in magnetic recording system. 3,614,305, Cl. 178-5.4
Higgins, Leonard James, to Dataco Systems Corporation. Signal generating apparatus using fiber optic sensors having multiple light inputs and a single common electro-optical output converter. 3,614,402, Cl. 235-154.
Hightower, Russell D.; and Aufill, Charles B., deceased0 (by Watkins, Paula J.; executrix), to Sparton Corporation. Fluted transducer pressure sensing member. 3,613,455, Cl. 73-418.
Hill, Charles C.; and Romberger, Frank, to Michigan Research Corporation. Skin graft cutter. 3,613,242, Cl. 30-305.
Hill, John Dan, III, to Collins Radio Company. Filter apparatus. 3,614,674, Cl. 333-20.
Hill, Robert Curtis; French, John M.; and Toepfer, Richard E., to Measurex Corporation. Apparatus for measuring the amount of a substance that is associated with a base material. 3,614,450, Cl. 250-210.
Hill, Rodney S., to ILC Industries, Inc. Detachable face shield support for a helmet. 3,613,115, Cl. 2-10.
Hill, Rodney S.; Urion, Kenard E.; and Felmann, Frederick W., to ILC Industries, Inc. Helmet supporting and positioning assemblies. 3,613,114, Cl. 2-3.
Hinerfeld, Norman M.; Noble, David S.; and Bartley, William H., to Kayser-Roth Corporation. Control equipment for manufacturing equipment such as sewing equipment and the like. 3,613,608, Cl. 112-2.
Hinerfeld, Norman M.; Noble, David S.; and Bartley, William H., to Kayser-Roth Corporation. Methods of automatically controlling manufacturing operations such as sewing operations and the like. 3,613,610, Cl. 112-262.
Hinkle, James O.: *See—*
Heckman, Edward A.; Hinkle, James O.; and Walls, Edgar H.,3,614,601.
Hinterthur, Helmut: *See—*
Hermes, Heinz; Hinterthur, Helmut; Otto, Arnold; Thieme, Klaus Dietrich; and Westhoff, Heinz,3,614,723.
Hirabayashi, Yoshiaki, to Sankyo Kogaku Kogyo Kabushiki Kaisha. Device for automatically effecting adjustments of the volume of light coming to an exposure meter of a camera. 3,613,535, Cl. 95-10.
Hirotsu, Tetsuji; and Sonobe, Hisao, to Hitachi, Ltd. Re-adhesion apparatus for vehicles. 3,614,564, Cl. 318-52.
Hisada, Souichi. Secondary air injection system for an internal combustion engine. 3,613,646, Cl. 123-75.
Hitachi, Ltd.: *See—*
Fujiyasu, Tatsuo; and Hara, Kouichi, 3,614,311.
Hirotsu, Tetsuji; and Sonobe, Hisao, 3,614,564.
Ishihara, Koichiro; and Nishimoto, Tetsunori, 3,614,747.
Manabe, Tosikatu; Gejyo, Tetsuo; and Hamura, Yasuzi, 3,614,376.
Matsui, Isao; Minamikawa, Yoshihisa; and Katagiri, Shinjiro, 3,614,422.
Minami, Shigeo, 3,614,337
Nara, Akinao; and Ono, Masahisa, 3,613,418.
Narisawa, Hiroshi, 3,614,751.
Teranishi, Yuichi, 3,614,476.
Hitze, Werner. Stand for cameras, microphones or the like. 3,614,047, Cl. 248-439.
Hluchan, Stpehen A.; Herman, Sidney; and Dowd, Eugene G., to Bowrns, Inc. Transport vehicle axle bearing alarm. 3,614,731, Cl. 340-57.
Hobart Manufacturing Company, The: *See—*
Hartley, Richard S., 3,613,754.
Hobbs, Milo Oldell, to North American Rockwell Corporation. System for detecting glaucoma. 3,613,666, Cl. 128-2.
Hobson, H. M., Limited: *See—*
Smith, Charles Philip; and Wynne, John Roger, 3,613,367.
Hochuli, Urs; and Haldemann, Paul R., to University of Maryland, The. Gas laser. 3,614,642, Cl. 330-4.3
Hock, Fromund, to Leitz, Ernst, G.m.b.H. Oscillating light beam generating device. 3,614,212, Cl. 350-285.
Hodges, Hato R.; and Schnell, Fred J. Reversible follow up positioning device for mobile antenna structures or the like. 3,614,574, Cl. 318-467.
Hodges, Ralph R., to Empire Stove Company. Expansion clip and method of installing recessed fixtures with such clips. 3,614,144, Cl. 287-189.35
Hodges, William H. Feedback pneumatic amplifier. 3,613,706, Cl. 137-81.5
Hoekstra, Evert M., to MKH, Inc. Keyboard pulse generator including a locking plate for use in telephone dialing. 3,614,331, Cl. 179-90.
Hoerbiger Ventilwerke Aktiengesellschaft: *See—*
Bauer, Friedrich, 3,613,719.
Hoerner Waldorf Corporation: *See—*
Jaeschke, Harold R., 3,613,973.
Hoffman, Lionel: *See—*
Van Auken, John A.; Rush, Christopher; Blank, Fritz A.; Hoffman, Lionel; and Barto, Robert,3,614,089.
Hogan, Walter H.; and Stuart, Robert W., to Cryogenic Technology, Inc. Cryogenic cycle and apparatus. 3,613,385, Cl. 62-6.
Hoheisel, Rainer; Fischer, Berthold; and Ackermann, Gunter, to Bosch, Robert, G.m.b.H. Pressure responsive control valve. 3,613,716, Cl. 137-491.
Holdredge, Ernest C., Jr., to Allastics, Inc. Four-way, double-face general purpose pallet. 3,613,605, Cl. 108-58.
Holken, Norbert; and Sprenger, Gerhard, to Gewerkschaft Eisenhutte Westfalia. Hinge connections. 3,614,141, Cl. 287-99.
Hollander, William L., to Chance, A. B., Co. Clutch or brake with electric pilot clutch. 3,613,845, Cl. 192-8.
Hollenberg, Dale W.; Loyd, Calvin D.; and Satzler, Ronald L., to Caterpillar Tractor Company. Friction welder. 3,613,982, Cl. 228-2.
Holm, Kurt Anders, to Uddeholms Aktiebolag. Apparatus for degreasing objects by means of a solvent. 3,613,699, Cl. 134-57.
Holm, William J., to Riggs & Lombard Inc. Cloth shear with changeable rest. 3,613,187, Cl. 26-15.
Holmes, Ronald L. W., to Union Carbide Corporation. Outside change tuyere. 3,614,083, Cl. 266-41.
Holmstrom, Frank R., to United States of America, National Aeronautics and Space Administration. Shielded-cathode mode bulk effect devices. 3,614,557, Cl. 317-235.
Holobeam, Inc.: *See—*
Vergoz, Ronald A., 3,614,226.
Holotron Corporation: *See—*
Haines, Kenneth A., 3,614,190.
Holsinger, Jerry Lee, to Codex Corporation. Data transmission method and system. 3,614,622, Cl. 325-42.
Holst, Jan-Olov M.; Nordstrom, Rolf E.; and Ekenberg, Christer U. Brake control for preventing locking during the braking of a rotating wheel. 3,614,176, Cl. 303-61.
Holtermann, Theodore J.: *See—*
Wick, Gerald H.; and Holtermann, Theodore J.,3,613,631.
Holzer Patent AG: *See—*
Apel, Konstantin, 3,614,535.
Holzer, Walter, 3,613,475.
Holzer, Walter, to Holzer Patent AG. Device for the preselection of a program. 3,613,475, Cl. 74-491.
Holzgruber, Wolfgang; Kleinhagauer, Otmar; and Geltewa, Hermann, to Gebr. Boehler & Co., AG. Installation for producing large blocks of metals through electroslag remelting. 3,614,285, Cl. 13-14.
Holzl, Robert A.; and Koenig, William D., to Fansteel Inc. Method of manufacturing weld tip guide. 3,613,766, Cl. 164-46.
Holzwerte AG: *See—*
Schifferle, Peter, 3,613,931.
Honeywell, Charles C.; and Voige, Louis H., to Bendix Corporation, The. Synchro-servo motor combination. 3,614,577, Cl. 318-654.
Honeywell Inc.: *See—*
Lagoe, James A., 3,614,721.
Zoerb, Edward G., 3,613,452.
Honjo, Yoshihiko: *See—*
Hidaka, Tsuneyoshi; Morita, Akiyoshi; Honjo, Yoshihiko; and Nishimura, Takashi,3,614,305.
Hoover Ball and Bearing Company: *See—*
Ziegler, William E., 3,613,169.
Hope Kabushiki Kaisha: *See—*
Iizuka, Michio, 3,614,117.
Hopfe, Dieter H.; and Wilson, William P., Sr., to Dresser Industries, Inc. Bubbler method and apparatus. 3,613,456, Cl. 73-439.
Horberg, Charles, Jr., to Norman Industries, Inc. Camera path generator. 3,613,538, Cl. 95-15.

Horn, John M., to Allis-Chalmers Manufacturing Company. Wicket gate overload sensor and protector. 3,613,721, Cl. 137-551.

Horst, Heinz: *See—*
Kampf-Emden, Gerd; Horst, Heinz; and Klapdohr, Friedrich Wilhelm,3,614,160.

Horstmann, Bevan Graham. Blood heating apparatus. 3,614,385, Cl. 219-303.

Horwitz, Norman H.; and Cook, Kenneth J., 1/2 to Lopstrom, James E. Automatic agitating and sample devices. 3,614,434, Cl. 250-71.5

Hosken, James C. Bearing construction. 3,614,179, Cl. 308-6.

Hosokawa, Tomoyuki: *See—*
Shimokusu, Kazuo; Korekawa, Takashi; Hosokawa, Tomoyuki; Yamamoto, Taro; and Kobayasi, Takao,3,613,405.

Hospe, Louis. Flow control valve. 3,614,057, Cl. 251-251.

Houghton, George F. Automatic gearshift for bicycle. 3,613,466, Cl. 74-217.

Housman, Earl R.: *See—*
Hale, David A.; and Housman, Earl R.,3,614,460.

Howe, August Wilhelm. Building block game. 3,613,291, Cl. 46-16.

Howell, Robert B. Installation of seam type zippers. 3,613,611, Cl. 112-265.

Howes, Leslie D., to Garrett Corporation, The. Combustion chamber construction. 3,613,360, Cl. 60-39.36

Hoyler, Gerhard: *See—*
Behn, Reinhard; Hoyler, Gerhard; and Kessler, Hartmut,3,614,561.

HPE, Inc.: *See—*
Lightfoot, Richard O.; and Kunzweiler, John J., 3,614,272.

Hrdina, Jiri, to Ceskoslovenska akademie ved. Photoelectric photometer. 3,614,242, Cl. 356-181.

Hreha, Fred J. Form and drain tile. 3,613,323, Cl. 52-169.

Hubbard, Frank T.; and Demers, Gaston, to Canada her Majesty the Queen in right of. Switch for projectile accelerating system. 3,613,499, Cl. 89-8.

Hubbard, Stephen R., to Universal Harvester Co., Inc. Finger for a pick-up reel. 3,613,346, Cl. 56-400.

Hubbell, Franklin R., III, to Walker Manufacturing Company. One piece tube and shell assembly for silencer. 3,613,830, Cl. 181-54.

Hubeli, Ernst: *See—*
Dosch, Peter; Heck, Reinhard; and Hubeli, Ernst,3,613,744.

Huber, George H.; Gertler, Eugene I.; Habgood, Dennis W.; Ciarrocchi, John A.; and Richman, Walter A., to Ultronic Systems Corporation. Quotation board system. 3,614,765, Cl. 340-324.

Huber, J. M., Corporation: *See—*
Hurst, Vernon J., 3,614,075.

Hubner, Erwin: *See—*
Katz, Helmut; and Hubner, Erwin,3,614,514.

Huchok, Arthur A., to Westinghouse Electric Corporation. Cam feed scanner type induction heating apparatus. 3,614,366, Cl. 219-10.69

Huempfner, David F.: *See—*
Grow, Harry N.; Huempfner, David F.; and Reich, Paul A.,3,613,606.

Hughes Aircraft Company: *See—*
Beelik, Victor, Jr.; and Rosenblatt, Jerome J., 3,614,439.
Knowlden, Gary L., 3,614,438.
Spurlin, Joseph L., 3,613,152.

Hughes, David C., to Child Guidance Toys Inc. Display advance mechanism. 3,613,278, Cl. 40-96.

Hughes, George C., to Textron Inc. Safety control for fluid pressure regulators. 3,613,725, Cl. 137-613.

Hughes, Nathaniel, to Energy Sciences Incorporated. Conditioning fluids. 3,613,722, Cl. 137-599.

Hulbert, Edward E.: *See—*
United States of America,National Aeronautics and Space Administration, Administrator, 3,614,327.

Humlong, Robert F., to Wald Manufacturing Company, Inc. Mounting means for bicycle baskets. 3,613,970, Cl. 224-36.

Humphrey, David H.: *See—*
Fernandez, Arthur; and Humphrey, David H.,3,613,329.

Humphrey, David S. Manufacture of barrel constructions. 3,613,757, Cl. 147-1.

Hunt, Robert P.: *See—*
Snarr, James L.; and Hunt, Robert P.,3,613,547.

Hunt-Wesson Foods, Inc.: *See—*
Lane, Alan B., 3,614,365.

Hunter, Charles G. Golf club, shaft, and head. 3,614,101, Cl. 273-80.2

Huntsinger, Dean P.; and Lundgreen, Michael W., to Collins Radio Company. Digital clock accuracy monitor. 3,614,619, Cl. 324-78.

Hurst, Vernon J., to Huber, J. M., Corporation. Viscosity reduction of kaolin by hydrothermal treatment. 3,614,075, Cl. 263-52.

Hutcheson, Guilford J., Jr.: *See—*
Johnston, James V.; and Hutcheson, Guilford J., Jr.,3,613,458.

Hutchinson, Stanley: *See—*
Jubb, Albert; Hutchinson, Stanley; and Webb, Richard H.,3,613,363.

Huthsing, Charles K. Jr. Fire extinguisher system. 3,613,793, Cl. 169-26.

Hyde, John W.; and George, William J., to British Petroleum Company Limited, The. Oil well and method for production of oil through permafrost zone. 3,613,792, Cl. 166-315.

Hydranautics: *See—*
Chambers, Henry B., 3,613,510.

Hydromation Engineering Company: *See—*
Schuricht, Henry A., 3,613,869.

I-T-E Imperial Corporation: *See—*
Jensen, Otto, 3,614,357.
Meier, Henry G.; and McCloud, James R., 3,614,356.

Ichimori, Masuo; and Suzaki, Hideyuki, to Omron Tateisi Electronics Co. Automatic water-supply apparatus. 3,613,123, Cl. 4-166.

Ickes-Braun Glasshouses, Inc.: *See—*
Coburn, Charles W., 3,613,309.

I. C. O. S. Impresa Costruzioni Opere Specializzate S p. A.: *See—*
Miotti, Giosue, 3,614,161.

Ideal Toy Corporation: *See—*
Amici, Francis Robert; and Bornn, Ralph, 3,613,299.

Iida, Masachika; and Imajo, Yasutaka, to Tokyo Shibaura Denki Kabushiki Kaisha. Circuit interrupting apparatus. 3,614,687, Cl. 335-195.

Iizuka, Michio, to Hope Kabushiki Kaisha. Sliding device for ski heel binding. 3,614,117, Cl. 280-11.35h

Ikegai Tekko Kabushiki Kaisha: *See—*
Tanabe, Yutaka; and Tajima, Masahaur, 3,613,192.

ILC Industries, Inc.: *See—*
Hill, Rodney S.; Urion, Kenard E.; and Felmann, Frederick W., 3,613,114.
Hill, Rodney S., 3,613,115.

Illinois Tool Works Inc.: *See—*
Fisher, Julian Vernon, 3,613,178.

Imajo, Yasutaka: *See—*
Iida, Masachika; and Imajo, Yasutaka,3,614,687.

IMC Magnetics Corporation: *See—*
Friese, Karl E., 3,614,261.

Imperial Chemical Industries Limited: *See—*
Crosby, David Winston, 3,613,190.

Index Industries, Inc.: *See—*
Woodward, Heber Jay, 3,613,356.

Indiana University Foundation: *See—*
Muhler, Joseph C.; and Stookey, George K., 3,613,143.

Industrial Electronic Hardware Corporation: *See—*
Erdmann, Hans, 3,614,276.

Information Storage Systems, Inc.: *See—*
Mac Arthur, Steven J., 3,613,214.

Inoue, Morio, to Matsushita Electronics Corporation. Semiconductor device having a TiO_2-SiO_2 composite oxide layer. 3,614,548, Cl. 317-234.

Institut de Recherches de la Siderurzie Francaise: *See—*
Tsymbal, Claude, 3,614,082.

Institute of Gas Technology: *See—*
Anderson, Philip J., 3,614,163.

Intercole Automation, Inc.: *See—*
Matsuoka, James T., 3,614,390.

Interlake, Inc.: *See—*
Coleman, Bestor P., 3,613,557.

International Automated Electronics Corporation: *See—*
Cameron, Joe, 3,614,326.

International Business Machines Corporation: *See—*
Anantha, Narasipur G., 3,614,560.
Belman, Harris J., 3,614,639.
Cook, Miles H.; Nystrom, Walter; Secrist, Duane R.; and Turk, Harold L., 3,613,228.
Giedd, Gary R.; Maley, Gerald A.; and Perkins, Merlyn H., 3,614,608.
Grubel, Stanley J.; and Stirling, Hugh R., 3,614,609.
Gunn, John B., 3,614,451.
Klose, Ulrich, 3,614,318.
La Pine, Anthony N.; and Vaughn, Julian E., 3,614,635.
Lean, Eric G.; Myers, Robert A.; and Pennington, Keith S., 3,614,462.
Lorenz, Max R.; and Nethercot, Arthur H., Jr., 3,614,549.
Marinace, John C.; and McGibbon, Ralph C., 3,614,550.
Mathisen, Einar S., 3,614,232.
Mc Intosh, Robert P.; and Padalino, Marco, 3,614,756.
McLaughlin, John A.; and Raviv, Josef, 3,614,736.
Podvin, Albert; and Flynn, Mchael J., 3,614,745.
Reed, David W., 3,613,856.
Wilfinger, Raymond J., 3,614,677.

International Harvester Company: *See—*
Carlson, V. Robert; Dinelli, Joseph; and Jones, Joel F., 3,613,802.
Heise, Robert H., 3,613,477.
Pool, Stuart D.; Meitl, Harold G.; Rickerd, Calvin P.; Middlesworth, Tommy A.; Findlay, Jack B.; Thayer, Arlie J.; and Svereika, Edward, 3,613,342.
Rickerd, Calvin P.; and Middlesworth, Tommy A., 3,613,868.

International Paper Company: *See—*
Evans, Clarton F., 3,614,154.
Westcott, Robert F., 3,613,938.

International Patents & Development Corporation: *See—*
Math, Irwin, 3,613,558.

International Standard Electric Corporation: *See—*
Dymoke-Bradshaw, Leslie Eugene Basil; and Tester, Norman William, 3,614,335.
Mosebach, Wolfgang; and Piper, Christopher Peter, 3,614,544.
Ribour, Jean Louis; and Denise, Francois Emile Clement, 3,614,666.

International Stretch Products, Inc.: *See—*
Sarmiento, Louis, 3,613,119.

International Telephone and Telegraph Corporation: *See—*
Mayle, Albert T., Jr., 3,614,625.
Ward, John H., III, 3,614,449.

Introvigne, Angelo, to Cole-Hersee Company. Integral-breaker trailer socket with bi-metallic breaker blades. 3,614,537, Cl. 317-98.

Inventors Engineering, Inc.: *See—*
Monson, Charles D., 3,613,924.

Iowa State University Research Foundation: *See—*
Schuster, Donald H., 3,613,263.

Ireland, Ralph H.; and Segrest, Joseph D., to United States of America, Navy. Sine wave static inverter. 3,614,589, Cl. 321-9.

Irik, Gijsbert W.: *See—*
Boersma, Rintje; and Irik, Gijsbert W.,3,614,717.

Irvin, Eugene, Jr.; and Carrell, Edwin A. Ignition device for internal combustion engine. 3,613,653, Cl. 123-146.5

Isaak, Robert D.: *See—*
Andrews, Daniel E., Jr.; Klund, William E.; and Isaak, Robert D.,3,614,316.

Isaak, Robert D.; and Littrell, Woodrow H., to United States of America, Navy. Cryptographic communication system. 3,614,780, Cl. 343-7.

Ishihara, Koichiro; and Nishimoto, Tetsunori, to Hitachi, Ltd. Instruction buffer system. 3,614,747, Cl. 340-172.5

Ishikawa, Kazuo: *See—*
Asano, Tadao; Yamaguchi, Hiroji; and Ishikawa, Kazuo,3,613,844.

Ishikawa, Shigeji; Terayama, Yuji; and Wada, Masuhiro, to Oval Kiki Kogyo Kabushiki Kaisha. Calorimeter for flowing fluids. 3,613,447, Cl. 73-193.

Isola, Richard A.; and Miller, Herman Keith. Bed clothes. 3,613,133, Cl. 3-334.

Itano, Takumi, to Komatsu Manufacturing Co., Ltd. Piston for internal combustion engine. 3,613,521, Cl. 92-186.

ITE Imperial Corporation: *See—*
Chumakov, Walter V., 3,614,464.

Itek Corporation: *See—*
Fletcher, Martin W., 3,614,667.
Sanford, Lloyd Clifford; and O'Brien, John Augustus, 3,614,241.
Stites, David G., 3,614,238.
Wirtz, John S., 3,614,527.

Ito, Saburo; and Ezaki, Shingo, to New Nippon Electric Company Ltd. Metal halide discharge lamp containing berylium. 3,614,508, Cl. 313-184.

Ivkovich, Mile. Swimming pool cover. 3,613,125, Cl. 4-172.14

Iwai, Katsuyuki; Fukatsu, Motonori; and Sato, Fujio, to Akai Electric Company Limited. Magnetic recording and reproducing system with alternating polarity inversion. 3,614,308, Cl. 178-6.6

Iwata, Akiyoshi, to Ampex Corporation. Head mount for a magnetic disc recorder. 3,614,333, Cl. 179-100.2

Jablovskis, Janis: *See—*
Brown, William J.; Butler, Robert F.; Hedden, Smith E.; and Jablovskis, Janis,3,613,592.

Jackson, Robert V.: *See—*
Burkett, Wilford B.; and Jackson, Robert V.,3,614,583.

Jackson, Wilbur F.: *See—*
Willson, James R.; Krueger, Keith T.; Tyler, Hugh J.; and Jackson, Wilbur F.,3,613,732.

Jacobe, Jean: *See—*
Allemand, Robert; Jacobe, Jean; and Roudaut, Edouard,3,614,437.

Jacobs, J Donovan. Method and apparatus for advancing tunnel supports. 3,613,384, Cl. 61-85.

Jacobs, Joseph Donovan. Method for advancing tunnel supports. 3,613,379, Cl. 61-42.

Jacobsen Manufacturing Company: *See—*
Akgulian, Sahag C.; Haffner, Donald G.; and Heth, Sherman C., 3,613,337.
Akgulian, Sahag C.; Haffner, Donald G.; and Heth, Sherman C., 3,613,340.

Jacobson, Irvin D., to Perfection Corporation. Reinforced plastic fitting. 3,614,137, Cl. 285-390.

Jacuzzi Bros., Incorporated: *See—*
Jacuzzi, Frank, 3,613,630.

Jacuzzi, Frank, to Jacuzzi Bros., Incorporated. Marine jet pump-out and fire fighting equipment. 3,613,630, Cl. 115-12.

Jaekle, William M.; Garin, Paul V.; Thomford, William E.; Greb, Wallace M.; Udaloff, Nicholas N.; and Peery, Stephen H., Jr. Apparatus for opening and closing doors pivotally attached to a railway car. 3,613,914, Cl. 214-38.

Jaeschke, Harold R., to Hoerner Waldorf Corporation. Tape dispensing carton. 3,613,973, Cl. 225-47.

Jager, Heinz, to Volkswagenwerk Aktiengesellschaft. Pressure casting machine. 3,613,156, Cl. 18-2.

Jamieson, Thomas A., to Draper Brothers Company. Felt for papermaking machine. 3,613,258, Cl. 34-95.

Janke, Gilbert J., to Sherwin-Williams Company, The. Foundry sand article forming machine with pivotal blow reservoir. 3,613,770, Cl. 164-192.

Janning, John L., to National Cash Register Company, The. Method and means for operating a plasma display panel. 3,614,526, Cl. 315-169.

Janning, John L., to National Cash Register Company, The. Read-only memory circuit. 3,614,750, Cl. 340-173.

Janoska, Georges: *See—*
Chaveneaud, Roger Marcel; and Janoska, Georges,3,614,330.

Janovec, Vaclav: *See—*
Glanc, Antonin; and Janovec, Vaclav,3,614,482.

Jardine, Maurice Revie: *See—*
Woodhead, James; Hedley, David Alan; and Jardine, Maurice Revie,3,613,573.

Javan, Ali; Bennett, William R., Jr.; and Herriott, Donald R., to Bell Telephone Laboratories, Incorporated. Optical maser. 3,614,653, Cl. 331-94.5

Javorek, Jaroslav: *See—*
Havranek, Milan; Zouhar, Drahomir; and Javorek, Jaroslav,3,613,400.

Jeffcoat, Keith; and Betts, Max William, to Courtaulds Limited. Knitting machine and method. 3,613,401, Cl. 66-60.

Jencks, David C., to Detroit Coil Company. Solenoid. 3,614,690, Cl. 335-250.

Jenkins, Cecil: *See—*
Woolslayer, Homer J.; Woolslayer, Joseph R.; Jenkins, Cecil; and Campbell, Erwin A.,3,613,905.

Jenkins, Robert; Mead, Carver A.; and McCaldin, James, to Monsanto Company, mesne. Ohmic contact to zinc sulfide devices. 3,614,551, Cl. 317-234.

Jenne, Leonard W., Jr.: *See—*
Doggett, Frederick F.; and Jenne, Leonard W., Jr.,3,614,502.

Jennings, Roy E., to Royal Seating Corporation. Student desk. 3,614,186, Cl. 312-194.

Jenny et Cie S.A.: *See—*
Jenny, Werner, 3,613,354.

Jenny, Werner, to Jenny et Cie S.A.Rim for a diver's watch. 3,613,354, Cl. 58-126.

Jensen, Carl A.; and Wood, Lowell L., Jr. Liquid electrode. 3,614,489, Cl. 310-11.

Jensen, David R., to Mobil Oil Corporation. Foldable frame structure for combination with a limp bag of plastic material to retain the bag in extended position above a support surface. 3,614,042, Cl. 248-97.

Jensen, Otto, to I-T-E Imperial Corporation. Gas blast circuit interrupter using main movable contact as blast valve. 3,614,357, Cl. 200-148.

Jensik, Robert E., to Chicago Miniature Lamp Works. Connector receptacle with wire deforming means. 3,614,716, Cl. 339-256.

Jerney, Rudolf: *See—*
Kaufmann, Kurt; Jerney, Rudolf; and Wandinger, Franz,3,614,707.

Jex, David W.: *See—*
Naumann, Robert J.; and Jex, David W.,3,613,794.

Jilsen, Per-Owe: *See—*
Bank, Henning; Jilsen, Per-Owe; Klein, Hans; and Persson, Tage,3,614,498.

Johansson, Bengt; and Nilsson, Erland, to Allmanna Svenska Elektriska Aktiebolaget. Spark gap with magnetic blowing of the arc. 3,614,536, Cl. 317-74.

Johnson, Charles E., to Double A Products Company. Fluid valve means. 3,613,715, Cl. 137-269.

Johnson, Edward W.: *See—*
Kelly, Raymond E.; and Johnson, Edward W.,3,613,626.

Johnson, George R., to Arpax Company, The. Method of producing cushioning dunnage. 3,613,522, Cl. 93-1.

Johnson, Jerold W.: *See—*
Wright, Colin S.; Fogelsong, Robert E.; Johnson, Jerold W.; and Jouhal, Teja S.,3,613,556.

Johnson, Jesse R., to AVM Corporation, mesne. Dual diaphragm three position actuator. 3,613,513, Cl. 92-48.

Johnson, Paul J. Electric arc can incinerator. 3,614,367, Cl. 219-69.

Johnson, Richard M. Radiation sensitive cassette leader detector. 3,614,453, Cl. 250-219.

Johnson, Richard M.; and Redmond, William G., to LTV Electrosystems, Inc. Chart display apparatus. 3,613,276, Cl. 40-36.

Johnson, Roger P. Apparatus to provide communication with the veins of a patient. 3,613,663, Cl. 128-2.

Johnson, Rowland E.: *See—*
Haisty, Robert W.; Johnson, Rowland E.; and Mehal, Edward W.,3,613,226.

Johnson, William E., to Owens-Illinois, Inc. Integrated driving circuitry for gas discharge panel. 3,614,739, Cl. 340-166.

Johnston, James V.; and Hutcheson, Guilford J., Jr., to United States of America, Army. Laser pickoff for strapdown gyroscopic accelerometer. 3,613,458, Cl. 73-504.

Jonathan Manufacturing Company: *See—*
Alvarez, William, 3,614,056.

Jones, Charles H., to Westinghouse Electric Corporation. Signal processing apparatus and method. 3,614,722, Cl. 340-6.

Jones, George B., to General Electric Company. Plural motor tension control for a reversing ingot carrier system. 3,614,563, Cl. 318-7.

Jones, James Elmo. Textile spool. 3,614,018, Cl. 242-118.61

Jones, James J.; Oxford, David B.; and Zuch, Howard W., to Texas Instruments, Incorporated. Frequency conversion system. 3,614,634, Cl. 328-140.

Jones, Joel F.: *See—*
Carlson, V. Robert; Dinelli, Joseph; and Jones, Joel F.,3,613,802.

Jones, John Paul: *See—*
Ceepo, Arvo H.; and Jones, John Paul,3,613,919.

Jones, R. A., and Company, Inc.: *See—*
Jones, Wickliffe, 3,613,526.

Jones, Stanley C.; Roszelle, Wayne O.; and Svaldi, Marvin A., to Marathon Oil Company. Oil recovery method using high water content oil- external micellar dispersions. 3,613,786, Cl. 166-273.

Jones, Wickliffe, to Jones, R. A., and Company, Inc. Carton feeding and erecting apparatus. 3,613,526, Cl. 93-53.
Jonsson, Nils Gunnar, to Atlas Copco Aktiebolag. Drilling apparatus for rotary drilling. 3,613,804, Cl. 173-149.
Jope, Bruce T.; and Witkowski, Leonard J., to Monsanto Company. Sheet advance apparatus. 3,613,979, Cl. 226-142.
Joslow, David L.; and Bosnak, John J., to Chester Electronic Laboratories, Inc. System for selecting and reproducing perceptible programs. 3,614,322, Cl. 179-1.
Jouhal, Teja S.: *See—*
Wright, Colin S.; Fogelsong, Robert E.; Johnson, Jerold W.; and Jouhal, Teja S.,3,613,556.
Jubb, Albert; Hutchinson, Stanley; and Webb, Richard H., to Rolls-Royce Limited. System for protecting gas turbine engine of a power plant while the engine is running down. 3,613,363, Cl. 60-39.52
Juhasz, Daniel P., to Monogram Industries, Inc. Adjustable screwdriver. 3,613,751, Cl. 144-32.
Julien, Robert, to Steel Heddle Manufacturing Company, mesne. Pirn. 3,614,017, Cl. 242-118.3
Justrite Mfg., Co.: *See—*
Williams, Clarence E., 3,613,942.
Jutice, Robert Earl: *See—*
Guerrero, Michael Carl; Jutice, Robert Earl; and Rudy, Richard Miller,3,613,976.
Kabushiki Kaisha Hattori Tokeiten: *See—*
Kitai, Kiyoshi, 3,613,533.
Kabushiki Kaisha Ricoh: *See—*
Ando, Sadanao, 3,613,701.
Fujimoto, Sakae, 3,613,269.
Kabushiki Kaisha Suwa Sukosha: *See—*
Kurino, Kikuo, 3,613,350.
Kabushiki Kaisha Toyota Chuo Kenkyusho: *See—*
Awano, Taikichi; and Oishi, Yoshihiro, 3,613,768.
Kobayashi, Akira, 3,614,277.
Kahlbrock, Heinz: *See—*
Benowitz, Paul; and Kahlbrock, Heinz,3,614,317.
Kahmann, Manfred. Punching machine. 3,613,491, Cl. 83-146.
Kaiser Aluminum & Chemical Corporation: *See—*
Finnegan, Walter D., 3,613,220.
Kaiser, Arthur E.; and Fluke, Jefferson M. Adjustable diameter pipe closure plug. 3,613,936, Cl. 220-24.5
Kajiura, Hiroshi: *See—*
Soejima, Tamihiko; Kajiura, Hiroshi; and Watanabe, Kinnosuke,3,613,449.
Kal-Pac Engineering Ltd.: *See—*
Llewellyn, Leopold W., 3,613,833.
Kaman Sciences Corporation: *See—*
Carr, Barney J., 3,614,440.
Kameyama, Yasuyoshi: *See—*
Suzuki, Yasuo; and Kameyama, Yasuyoshi,3,614,495.
Kaminski, Stephen H.: *See—*
Baynes, William R.; and Kaminski, Stephen H.,3,613,307.
Kampe, Robert F.; and White, Albert H., to Chandler Evans, Inc. Fluidic displacement transducer. 3,613,708, Cl. 137-81.5
Kampf-Emden, Gerd; Horst, Heinz; and Klapdohr, Friedrich Wilhelm, to Demag Aktiengesellschaft. Device for bracing a driving machine with respect to a shaft or tunnel wall. 3,614,160, Cl. 299-1.
Kane, Morris W.: *See—*
Colgren, Theodore; and Kane, Morris W.,3,613,437.
Kane, Neil G., to Rain Bird Sprinkler Mfg., Corporation. Adjustable sprinkler head. 3,613,995, Cl. 239-200.
Kanegafuchi Boseki Kabushiki Kaisha: *See—*
Matsui, Masao; and Yamabe, Masahiro, 3,613,173.
Kang, George Su; and Goodwin, Robert Lewis, to Bunker-Ramo Corporation, The. Technique for utilizing a single pulse to set the gains of a transversal filter. 3,614,673, Cl. 333-18.
Kantor, Paul R., to Kantor Press Kontrols, Inc. Oscillator roller for printing presses. 3,613,575, Cl. 101-148.
Kantor Press Kontrols, Inc.: *See—*
Kantor, Paul R., 3,613,575.
Kaplan, Sam H., to Zenith Radio Corporation. Color picture tube screen with phosphors dots overlapping portions of a partial-light-transmissive black-surround material. 3,614,504, Cl. 313-92.
Karr, Gerald W., to Beloit Corporation. Nip relieving apparatus for a reel. 3,614,011, Cl. 242-64.
Karr, Joseph R.: *See—*
Simpkins, Robert L.; Karr, Joseph R.; and Lagg, Jerry W.,3,614,371.
Kassner, Jochen: *See—*
Anna, Otto; Kassner, Jochen; and Druen, Bernhard,3,614,491.
Kastner, William D.: *See—*
Watson, William J.; and Kastner, William D.,3,614,742.
Katagiri, Shinjiro: *See—*
Matsui, Isao; Minamikawa, Yoshihisa; and Katagiri, Shinjiro,3,614,422.
Katz, Helmut; and Hubner, Erwin, to Siemens Aktiengesellschaft. Dispenser cathode structure. 3,614,514, Cl. 313-346.
Kaufman, Martin H., to United States of America, Navy. Hybrid high energy propulsion method. 3,613,373, Cl. 60-219.
Kaufmann, Kurt; Jerney, Rudolf; and Wandinger, Franz, to Siemens Aktiengesellschaft. Electrical connector. 3,614,707, Cl. 339-17.
Kautsky, George J. Textilana Corporation Method for the treatment of terrestrial fluid reservoirs. 3,613,788, Cl. 166-279.
Kawakami, Shojiro: *See—*
Nishizawa, Jun-Ichi; Kawakami, Shojiro; and Kiyasu, Zen'iti,3,614,197.
Kayser-Roth Corporation: *See—*
Hinerfeld, Norman M.; Noble, David S.; and Bartley, William H., 3,613,608.
Hinerfeld, Norman M.; Noble, David S.; and Bartley, William H., 3,613,610.
Kazamaki, Tomokazu: *See—*
Matsumoto, Tohru; and Kazamaki, Tomokazu,3,614,208.
Kazdin, Ronald S. Hairpiece and laminated base therefor. 3,613,695, Cl. 132-53.
Kean, George W. Fowl sling. 3,613,552, Cl. 99-426.
Keane, Thomas P. Vacuum assembly for hair clipper. 3,613,237, Cl. 30-133.
Keehn, George R.: *See—*
Apstein, Maurice; Blomgren, Evert; Keehn, George R.; Andrews, Laurence M.; and Rabinow, Jacob,3,613,589.
Kees, George, Jr.; and Hickmann, Horst R., said Hickmann, to said Kees. Clip applying surgical instrument. 3,613,683, Cl. 128-325.
Keller, Harold; and Young, Patrick J., to Potlatch Forests, Inc. Indexing crossband veneer for automatic plywood layup equipment. 3,613,859, Cl. 198-29.
Kelley Manufacturing Company: *See—*
Whitfield, Carroll J.; and Whitesides, Jack C., 3,613,797.
Kelly, Hubert K.; McDonnell, Thomas J.; and Lamkin, Richard C., to Rockwell Manufacturing Company. Method of fabricating a cutter. 3,613,485, Cl. 76-101.
Kelly, Raymond E.; and Johnson, Edward W., to United States of America, Navy. Remote operated lift control device. 3,613,626, Cl. 114-235.
Kelsey-Hayes Company: *See—*
Riordan, Hugh E., 3,614,172.
Rozmus, Walter J., 3,613,984.
Kemble, Mern S., to Morris, Philip, Incorporated. Suture packaging. 3,613,879, Cl. 206-63.3
Kenco Coffee Company Limited: *See—*
Champion, Ronald Cheyney, 3,613,549.
Kendall Company, The: *See—*
Kennedy, William J., 3,613,687.
Kendall, Lytton A., Jr., to Ohio State University, The. Wire drawing apparatus and method using intermediary impact device. 3,613,422, Cl. 72-56.
Kenderdine, Eugene W., to United States of America, Atomic Energy Commission. Programmable timer. 3,614,465, Cl. 307-139.
Kennametal Inc.: *See—*
Nemeth, Bela J.; and Boeckeler, Benjamin Clark, 3,613,164.
Kennedy, Carroll Trowbridge, to Thiokol Chemical Corporation, mesne. High strength tufted pile fabric. 3,613,612, Cl. 112-410.
Kennedy, Paul B., to Boeing Company, The. High speed faired towing cable. 3,613,627, Cl. 114-235.
Kennedy, Ralph C., to Colt's Inc. Revolver cylinder pin and lock therefor. 3,613,285, Cl. 42-59.
Kennedy, William J., to Kendall Company, The. Quick-drying, absorbent nether garment. 3,613,687, Cl. 128-288.
Kennerley, Cyril, to E.R.F. Engineering Limited. Presses. 3,613,163, Cl. 18-16.
Kenney, Thomas A., to Kenzdof Incorporated, mesne. Apparatus for photography. 3,614,206, Cl. 350-179.
Kenzdof Incorporated: *See—*
Kenney, Thomas A., 3,614,206.
Keplinger, Edward G.: *See—*
Krallinger, Robert E.; Keplinger, Edward G.; and Terrell, Jerry W.,3,614,319.
Keranen, John J., to Cutler-Hammer, Inc. Lighted toggle lever switch. 3,614,362, Cl. 200-167.
Kerma Corporation: *See—*
Forster, Klaus W.; and Schaper, Donald W., 3,613,602.
Kernick, Andress, to Westinghouse Electric Corporation. Programmed waveform static inverter for digitally generating A-C waveforms comprised of a pattern of equal width voltage pulses. 3,614,590, Cl. 321-9.
Kerr, John; and Lasbrey, Ian, to National Research Development Corporation. Load-supporting device. 3,613,821, Cl. 180-125.
Kerst, Donald W.: *See—*
Schmidt, John A.; and Kerst, Donald W.,3,614,606.
Kessler, Hartmut: *See—*
Behn, Reinhard; Hoyler, Gerhard; and Kessler, Hartmut,3,614,561.
Keyston, David H., to Anza Pacific Corporation. Combined building walls panels and associated form structure. 3,614,049, Cl. 249-19.
Keystone Consolidated Industries, Inc.: *See—*
Glass, Dwight W.; and Dauenbaugh, Robert L., 3,613,413.
Henson, Richard C., 3,613,151.
Kidney, John B.: *See—*
Wrob, Ronald M.; and Kidney, John B.,3,614,387.
Kienitz, Martin E.: *See—*
Corbin, Thomas H.; and Kienitz, Martin E.,3,613,669.
Kienzle Apparate GmbH: *See—*
Mutz, Gerhard; Hettich, Bernhard; and Moser, Werner, 3,614,094.
Kievit, James M., to Dick, A. B., Company. Display device including roll and crawl capabilities. 3,614,766, Cl. 340-324.

Kimberly-Clark Corporation: *See—*
Endres, Dan D.; and Carter, Ronald D., 3,613,676.
King, Bernard G.: *See—*
Biazzo, Martin R.; King, Bernard G.; and Ortel, William C. G.,3,614,201.
King, Elliott L., to Hercules Incorporated. Projectile retention system for caseless ammunition. 3,613,587, Cl. 102-40.
King, Kenneth G., to Westinghouse Brake and Signal Company Limited. Electrical chopper regulator circuits. 3,614,586, Cl. 321-2.
Kinsey, James M. Golf training device. 3,614,107, Cl. 273-188.
Kinzler, Fritz: *See—*
Hansgen, Klaus; Kinzler, Fritz; and Spohr, Hans Werner,3,613,139.
Kirby, Donald R. End ejecting coffin. 3,613,189, Cl. 27-35.
Kirche, Robert M. Drapery pleating, folding and stretching apparatus. 3,613,968, Cl. 223-32.
Kirk, Walter B., to Marathon Oil Company. Process for stimulation of gas producing wells. 3,613,791, Cl. 166-305.
Kirkman Laboratories, Inc.: *See—*
Gores, Kenneth W., 3,614,414.
Kissell, Kenneth E., to United States of America, Air Force. Photoelectric space-object position measuring device. 3,614,239, Cl. 356-152.
Kisselmann, Willy; Rumpelein, Fritz; Landbrecht, Franz; and Knopf, Paul, to Agfa-Gevaert Aktiengesellschaft. Coil assembly for moving-coil instruments. 3,614,612, Cl. 324-154.
Kistler Instruments AG: *See—*
Sonderegger, Hans Conrad; and Spescha, Gelli, 3,614,488.
Kitai, Kiyoshi, to Kabushiki Kaisha Hattori Tokeiten. Automatic flashing device. 3,613,533, Cl. 95-10.
Kittredge, John B.; and Larson, Richard L., to Minnesota Mining and Manufacturing Company. Media for finishing plastics and soft metals. 3,613,317, Cl. 51-164.5
Kiwalle, Jozef, to Caterpillar Tractor Company. Welder power and drive system. 3,613,218, Cl. 29-470.3
Kiyasu, Zen'iti:*See—*
Nishizawa, Jun-Ichi; Kawakami, Shojiro; and Kiyasu, Zen'iti,3,614,197.
Klann, Paul A. Multiplexing arrangement for electronic organs. 3,614,287, Cl. 84-1.01
Klapdohr, Friedrich Wilhelm: *See—*
Kampf-Emden, Gerd; Horst, Heinz; and Klapdohr, Friedrich Wilhelm,3,614,160.
Klaus, Frank J.: *See—*
Deyo, Bruce; and Klaus, Frank J.,3,613,906.
Kleckner, Harold F., to McDonnell Douglas Corporation. Turbofan powered STOL aircraft. 3,614,028, Cl. 244-15.
Klee, David J., to Air Products and Chemical Inc. Cryogenic freezer control. 3,613,386, Cl. 62-64.
Klein, Erwin; Koch, Werner; and Walz, Heinz, to Siemens Aktiengesellschaft. Device for regulating and determining changes of a CO_2 content in a climatic gas-exchange chamber. 3,613,308, Cl. 47-17.
Klein, Hans: *See—*
Bank, Henning; Jilsen, Per-Owe; Klein, Hans; and Persson, Tage,3,614,498.
Kleinhagauer, Otmar: *See—*
Holzgruber, Wolfgang; Kleinhagauer, Otmar; and Geltewa, Hermann,3,614,285.
Klem, Franklin D., to Westinghouse Electric Corporation. Slant shelf vending machine magazine. 3,613,946, Cl. 221-109.
Klema, Lawrence E.: *See—*
Brandli, Ronald I.; Klema, Lawrence E.; and Reese, Garald D.,3,613,811.
Klinkhamer, Jacob Fredrik, to U.S. Philips Corporation. Memory adressing device using arbitrary directed graph structure. 3,614,746, Cl. 340-172.5
Klockner-Humboldt-Deutz Aktiengesellschaft: *See—*
Mettig, Hermann; Hartmann, Ernst-Siegfried; and Lewin, Georg-Wilhelm, 3,613,647.
Kloppenborg, Nico J., to U.S. Philips Corporation. Switching device. 3,614,472, Cl. 307-255.
Klose, Ulrich, to International Business Machines Corporation. Data transmission system. 3,614,318, Cl. 178-68.
Klund, William E.: *See—*
Andrews, Daniel E., Jr.; Klund, William E.; and Isaak, Robert D.,3,614,316.
Knappstein, Johannes, to Still, Carl, Firma. Charging truck for coking furnace. 3,613,913, Cl. 214-35.
Knauer, Wolfgang: *See—*
United States of America,National Aeronautics and Space Administration, Administrator, 3,613,370.
Kneusels, Rudolf, to Bi-Flex Birkenstock KG. Polishing ring. 3,613,145, Cl. 15-230.15
Knight, Jack B., to Morris, Philip, Incorporated. Material transport tension control system and apparatus. 3,613,975, Cl. 226-25.
Knight, Sigmund P. Matrix retainer. 3,613,245, Cl. 32-63.
Knollenberg, Robert G., to United States of America, National Science Foundation. Weather modification method. 3,613,992, Cl. 239-2.
Knopf, Paul: *See—*
Kisselmann, Willy; Rumpelein, Fritz; Landbrecht, Franz; and Knopf, Paul,3,614,612.
Knowlden, Gary L., to Hughes Aircraft Company. Target motion detection for infrared search systems. 3,614,438, Cl. 250-83.3
Knowles, Edwin C.; and Mc Coy, Frederic C., to Texaco Inc. Heating composition. 3,613,658, Cl. 126-59.5
Kobayashi, Akira, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Vane-type rotary engine. 3,614,277, Cl. 418-253.
Kobayasi, Takao: *See—*
Shimokusu, Kazuo; Korekawa, Takashi; Hosokawa, Tomoyuki; Yamamoto, Taro; and Kobayasi, Takao,3,613,405.
Kobori, Toshio: *See—*
Kuramoto, Yoshio; and Kobori, Toshio,3,614,013.
Koch, Albert F., to General Electric Company. Linearization of a digital phase control power amplifier for dynamo electric machine. 3,614,571, Cl. 318-345.
Koch, Werner: *See—*
Klein, Erwin; Koch, Werner; and Walz, Heinz,3,613,308.
Kochkin, Georgy Mikhailovich: *See—*
Mesheingisser, Mikhail Yakovlevich; Ermakov, Ivan Semenovich; Kochkin, Georgy Mikhailovich; Stankun, Alexandr Viktorovich; Shakhov, Filipp Nikolaevich; Velednitsky, Ilya Pinkhusovich; and Yagodin, Petr Petrovich,3,613,563.
Kock, Bruce A. Watch. 3,613,353, Cl. 58-59.
Koehl, Douglas E. Portable livestock pen. 3,614,068, Cl. 256-19.
Koehnle, Ronald L., to Reliable Pattern Works, Inc. Golf club cover. 3,613,760, Cl. 150-52.
Koehring Company: *See—*
Wilke, Raud A., 3,613,711.
Koenig, Hans A.: *See—*
De Nobel, Richard W.; Schurman, Donald G.; Lindstadt, Theodore J., Jr.; and Koenig, Hans A.,3,613,619.
Koenig, William D.: *See—*
Holzl, Robert A.; and Koenig, William D.,3,613,766.
Koepfgen, William S., to Ekstrom Industries, Inc. Meter disconnect device. 3,614,708, Cl. 339-36.
Koger, Dorothy G.: *See—*
Koger, Edward B.; and Koger, Dorothy G.,3,613,554.
Koger, Edward B.; and Koger, Dorothy G. Laminated cooking pad and methods of making same. 3,613,554, Cl. 99-446.
Koger, Everett L. Trash bag holder. 3,614,041, Cl. 248-97.
Kohler, John C.; Sutliff, Robert C.; and Zollo, Corrado, to Eastman Kodak Company. Anti-clockspring device and method. 3,613,876, Cl. 206-52.
Koike, Hiroshi; and Fujita, Rokuro, to Tokyo Shibaura Denki Kabushiki Kaisha, a/k/a Tokyo Shibaura Co., Ltd. Electric switch having oppositely operating dual contacts. 3,614,354, Cl. 200-146.
Kojima, Koichi; and Nakamura, Tadahiko, to Sony Corporation. Display system with different intensity indication. 3,614,524, Cl. 315-84.6
Kolb, Edwin R.; and Drake, Herbert E., to Harris-Intertype Corporation. Apparatus for providing graphical images on a radient energy responsive surface. 3,614,764, Cl. 340-324.
Komatsu Manufacturing Co., Ltd.: *See—*
Itano, Takumi, 3,613,521.
Kombinat VEB Elektonische Bauelemente: *See—*
Teuschler, Hans-Joachim, 3,614,552.
Komori, Shigehiro; Sato, Jiro; and Kurahashi, Akira, to Canon Kabushiki Kaisha Co., Ltd. Electrophotographic copying device. 3,614,220, Cl. 355-3.
Konig, Ferdinand, to Sulzer Brothers, Ltd. Control device having means for electrically simulating and compensating the inertia momentum of the moving parts of an electrical positioning means. 3,614,566, Cl. 318-211.
Konishi, Yoshihiro, to Nippon Hoso Kyokai. Isolator comprising tuned lamped element circulator. 3,614,675, Cl. 333-24.2
Koontz, Roland F., to United States of America, Atomic Energy Commission. Coaxial cable high-voltage pulse isolation transformer. 3,614,694, Cl. 336-174.
Koranyi, Robert, to Allmanna Svenska Elektriska Aktiebolaget. Transformer tank. 3,613,941, Cl. 220-71.
Korekawa, Takashi: *See—*
Shimokusu, Kazuo; Korekawa, Takashi; Hosokawa, Tomoyuki; Yamamoto, Taro; and Kobayasi, Takao,3,613,405.
Korpel, Adrianus, to Zenith Radio Corporation. Electro-optical apparatus employing a hollow beam for translating an image of an object. 3,614,310, Cl. 178-6.8
Kosar, John P.: *See—*
Thresher, Richard G.; Kosar, John P.; and Harper, James F.,3,613,593.
Kosich, Lawrence J.: *See—*
Eichelberger, Charles D.; and Kosich, Lawrence J.,3,614,350.
Kotera, Hiroaki: *See—*
Sasabe, Kaoru; and Kotera, Hiroaki,3,614,307.
Kothe, Erich W.; and Laird, Andrew C., to Anaconda Wire and Cable Company. Termination and joint for tap-proof cable. 3,614,289, Cl. 174-19.
Koulicovitch, Maurice; Pettavel, Jacques; and Wehrli, Pierre, to Societe Genevoise d'Instruments de Physique. Machine for measuring geometrical parameters of a transparency, such as masks for integrated circuits. 3,614,454, Cl. 250-219.
Krallinger, Robert E.; Keplinger, Edward G.; and Terrell, Jerry W., to Graphic Sciences, Inc. Telephonic transmission of data in graphic form. 3,614,319, Cl. 178-69.5
Kramer, Manfred: *See—*
Flaschar, Heinz; Weigert, Wilhelm; Werner, Walter; and Kramer, Manfred,3,613,509.
Kratzer, Dale L., to RCA Corporation. Doppler correlation radar system. 3,614,785, Cl. 343-7.7

Krause, Gerhard, to Fernseh GmbH. Arrangement for correcting timing errors in color television signals. 3,614,303, Cl. 178-5.4

Krauss, Hans G., to Boeing Company, The. Jam-proof and fail operational servo valve for aircraft flight control hydraulic systems. 3,613,504, Cl. 91-32.

Krauss, Rudolf, to Bosch, Robert, G.m.b.H. Closing spring adjusting means for a fuel injection valve. 3,613,998, Cl. 239-453.

Krehbiel, Robert D.; and Graber, Homer R., to Cessna Aircraft Company, The. Hydraulic valve. 3,613,508, Cl. 91-420.

Kroeger, Richard A.; and Sweattie, Juel G. Conveyor having twisted track sections. 3,613,867, Cl. 198-177.

Krueger, Keith T.: *See—*
Willson, James R.; Krueger, Keith T.; Tyler, Hugh J.; and Jackson, Wilbur F.,3,613,732.

Krueger Metal Products, Inc.: *See—*
Hendrickson, Philip J.; and Resch, Richard J., 3,614,157.

Krueger, Walter J.: *See—*
Minnich, Violet C.; and Krueger, Walter J.,3,613,191.

Kruschke, Melvin W. Field service vehicle. 3,613,918, Cl. 214-75.

Kuawamoto, Hiroshi: *See—*
Takimura, Shojiro; Doi, Tomeji; and Kuawamoto, Hiroshi,3,613,319.

Kubanoff, Jacob H., to United States of America, Army. Divergent filter system. 3,614,637, Cl. 328-167.

Kuchuris, George F.: *See—*
Yatsushiro, Kenji; and Kuchuris, George F.,3,614,492.

Kuffer, Clarence O., to Valve Corporation. Aerosol valve. 3,614,062, Cl. 251-354.

Kukla, Frank A., to Malco Manufacturing Company, Inc. Ground connector. 3,614,706, Cl. 339-14.

Kulig, Frank M.; and Layman, Lee R., to Monsanto Company. Sheet advance apparatus. 3,613,980, Cl. 226-162.

Kummer, Fritz: *See—*
Beck, Charlotte; Roll, Karl; and Kummer, Fritz,3,613,668.

Kunzweiler, John J.: *See—*
Lightfoot, Richard O.; and Kunzweiler, John J.,3,614,272.

Kupsis, Herbert, to Harnischfeger Corporation. Overhoist limit switch. 3,614,349, Cl. 200-47.

Kurahashi, Akira: *See—*
Komori, Shigehiro; Sato, Jiro; and Kurahashi, Akira,3,614,220.

Kuramoto, Yoshio; and Kobori, Toshio, to Minolta Camera Kabushiki Kaisha. Spool for winding films. 3,614,013, Cl. 242-74.

Kurino, Kikuo, to Kabushiki Kaisha Suwa Sukosha. Electric timepiece. 3,613,350, Cl. 58-23.

Kuryla, Bruce S.: *See—*
Galian, John N.; and Kuryla, Bruce S.,3,614,325.

Kutik, Louis F.: *See—*
Gronemeyer, Erich W.; and Kutik, Louis F.,3,613,964.

Kuwabara, Masayoshi, to Bridgestone Tire Company Limited. Stranded wire reinforced fluid transporting hose. 3,613,736, Cl. 138-109.

Kyle, Robert J.; and Meadows, Donald M., to Lockheed Aircraft Corporation. Method and apparatus for contour measurement. 3,614,237, Cl. 356-120.

Kytta, Oswald O., to Bendix Corporation, The. Servomotor having improved no-power operation. 3,613,506, Cl. 91-369.

L & A Products, Inc.: *See—*
Thompson, Richard G., 3,613,997.

Labussiere, Andre, to Avions Marcel Dassault. Device for attenuating noise emitted by the jet of a jet engine. 3,613,827, Cl. 181-33.

Lace, Melvin A., to Motorola, Inc. Rotary transformer for alternator. 3,614,593, Cl. 322-28.

Lagg, Jerry W.: *See—*
Simpkins, Robert L.; Karr, Joseph R.; and Lagg, Jerry W.,3,614,371.

Lagoe, James A., to Honeywell Inc. Control apparatus. 3,614,721, Cl. 340-5.

La Hue, Joseph E. Vibrating therapeutic cushion. 3,613,673, Cl. 128-33.

Lai, William; and Trowbridge, John C., to United States of America, Air Force. Altitude compensated hybrid infrared flares. 3,613,583, Cl. 102-37.8

Laidman, Robert, 1/10 to Plastimetrix Corporation, and 1/10 to Bass, Alvin S. Egg carton. 3,613,987, Cl. 229-44.

Laird, Andrew C.: *See—*
Kothe, Erich W.; and Laird, Andrew C.,3,614,289.

Lamburn, Alan Salisbury: *See—*
Vaughan, Roy Cyril, 3,613,473.

Lamkin, Richard C.: *See—*
Kelly, Hubert K.; McDonnell, Thomas J.; and Lamkin, Richard C.,3,613,485.

Lamonde, Romeo L.: *See—*
Fiedorowicz, John J.; and Lamonde, Romeo L.,3,613,634.

Lamoureux, Roland W., to Hedison Corporation. Clamp type earring construction having reversibly mounted ornamental member. 3,613,393, Cl. 63-14.

Lancaster, Paul M.: *See—*
Conn, Harry; Mauk, Robert W.; and Lancaster, Paul M.,3,613,493.

Lanctot, Robert S., to Chandler Evans, Inc. Integrated pump-control system using a unitized pump. 3,614,269, Cl. 417-253.

Landa, Torstein; Syvakari, Perti; and Westman, Erik, to Allmanna Svenska Elektriska Aktiebolaget. Pressure chamber for treating material with high pressure, such as isostatic compression of powder bodies. 3,613,157, Cl. 18-5.

Landbrecht, Franz: *See—*
Kisselmann, Willy; Rumpelein, Fritz; Landbrecht, Franz; and Knopf, Paul,3,614,612.

Landen, William James, to Eyelet Specialty Company. Safety-closure device. 3,613,928, Cl. 215-9.

Landman, Dirk; and Pinger, Edmund G., to Berg Electronics, Inc. Staking machine. 3,613,213, Cl. 29-203.

Lane, Alan B., to Hunt-Wesson Foods, Inc., mesne. Apparatus for cooking bacon and other meat products by microwave energy. 3,614,365, Cl. 219-10.55

Lanford, Milton N.: *See—*
Shaw, Henry W.; and Lanford, Milton N.,3,614,321.

Langas, Arthur; and Lingle, Harrison C., to Hartco Company. U-Clip assembly. 3,613,878, Cl. 206-56.

Lansing Bagnall Limited: *See—*
Payne, Ivan Salisbury; and Goodacre, Cecil, 3,614,567.

La Pine, Anthony N.; and Vaughn, Julian E., to International Business Machines Corporation. Variable frequency control system and data standardizer. 3,614,635, Cl. 328-155.

Lapinski, Charles W., to Ford Motor Company. Reinforced case for an automatic transmission. 3,613,481, Cl. 74-75.

Larkin, Dennis J.: *See—*
Greenwald, Harry; and Larkin, Dennis J.,3,614,681.

Larkin, Mark E., to Phillips Petroleum Company. Magnetic tape holder. 3,613,895, Cl. 211-40.

Larsen, Donald Wayne; and Ceresa, Raymond John. Photocurable resin impregnated bandage for forming rigid surgical casts. 3,613,675, Cl. 128-90.

Larson, Richard L.: *See—*
Kittredge, John B.; and Larson, Richard L.,3,613,317.

Lasbrey, Ian: *See—*
Kerr, John; and Lasbrey, Ian,3,613,821.

Lauck, Peter, III, to Stevens, J. P., & Company, Inc., mesne. Control circuit for composite electronic modular flexible heating element. 3,614,391, Cl. 219-501.

Lauck, William A., to Emerson Electric Co. Axial pipe cutter. 3,613,236, Cl. 30-92.5

Lawson, Thomas G., to Girling Limited. Vehicle braking systems. 3,614,175, Cl. 303-22.

Layman, Lee R.: *See—*
Kulig, Frank M.; and Layman, Lee R.,3,613,980.

Lean, Eric G.; Myers, Robert A.; and Pennington, Keith S., to International Business Machines Corporation. Optical parametric amplification and detection system. 3,614,462, Cl. 307-88.3

Lear Siegler, Inc.: *See—*
Barker, Loren B., 3,613,886.
Posh, Raymond C.; and Downs, William T., 3,613,359.

Leblond, Jean; and Biet, Jean, to Uniroyal Englebert France S.A. Transfer apparatus. 3,613,903, Cl. 214-1.

Le Can, Claude Jan Principe Frederic; and Steinmaier, Walter, to U.S. Philips Corporation, mesne. Semiconductor devices with more than one semiconductor circuit element in one body. 3,614,558, Cl. 317-235.

Lee, Charles A.; and Sorrells, Frank D., to Appleton Wire Works Corporation, mesne. Animal cage protective cover and method of making same. 3,613,639, Cl. 119-15.

Lee, Harold William, to Scragg, Ernest, & Sons Limited. Textile apparatus. 3,613,467, Cl. 74-215.

Leesona Corporation: *See—*
Stoppard, William E., 3,613,862.

Legatti, Raymond H., to Electromagnetic Industries, Inc. Portable voltage and frequency tester. 3,614,610, Cl. 324-115.

Lehman, Melvin T. Hanger for supporting light fixtures, etc.. 3,614,046, Cl. 248-343.

Leibowitz, Lawrence M.; and Baldauf, Richard K., to United States of America, Navy. Digital pulse width generator. 3,614,632, Cl. 328-58.

Leitz, Ernest, G.m.b.H.: *See—*
Schlapp, Werner, 3,614,196.

Leitz, Ernst, G.m.b.H.: *See—*
Hock, Fromund, 3,614,212.
Wiessner, Willi; and Mann, Georg, 3,613,542.

Lejeune, Daniel, to Compagnie Generale des Establissements Michelin. Transmission of information between elements in relative motion. 3,614,732, Cl. 340-58.

Lennartz, Walter. Plastic file folders. 3,613,281, Cl. 40-359.

Lenorak, Ferdinand, to Chemicke Zavody Julia Dimitrova narodni podnik. Yarn winding assembly. 3,614,007, Cl. 242-46.4

Lense, Robert F.; and Court, Wilbur M., to Riegel Paper Corporation. Carton handling device. 3,613,525, Cl. 93-53.

Lenton, Donald R., to United States of America, Army. Missile arming device. 3,613,591, Cl. 102-70.2

Leonard, Kenneth R., to Cryogenic Engineering Company. Inner container support structure for dewar vessel. 3,613,934, Cl. 220-14.

Lepselter, Martin P.: *See—*
Berglund, Carl N.; and Lepselter, Martin P.,3,614,480.

Le Rouzic, Jean; and Mascarin, Guy J. Device for rapidly interconnecting two insulated electrical conductors. 3,614,294, Cl. 174-84.

Letter, Eugene C., to Bausch & Lomb Incorporated. Electrically actuated shutter. 3,614,202, Cl. 350-160.

Letter, Eugene C., to Bausch & Lomb Incorporated. High speed optical shutter. 3,614,203, Cl. 350-160.

Letter, Eugene C., to Bausch & Lomb Incorporated. Electrically actuated shutter. 3,614,211, Cl. 350-285.

Leuthold, Charles; and Leuthold, Francoise. Protective brick against radio-active radiations. 3,614,446, Cl. 250-108.
Leuthold, Francoise: *See—*
Leuthold, Charles; and Leuthold, Francoise,3,614,446.
Levamaki, Reijo; Vehvilainen, Mikko; and Suhonen, Tapani. Hollow charge having a directed explosive effect. 3,613,582 Cl. 102-24.
Levin, Martin E. Transparencies teaching a method involving movement. 3,613,267, Cl. 35-29.
Levinson, Boris Alexandrovich: *See—*
Yalyshev, Aly Umyarocivh; Svecharnik, David Veniaminovich; Pavlenko, Vladimir Alexandrovich; Tsarkov, Vyacheslav Alexeevich; Bonch-Bruevich, Andrei Mikhailovich; and Levinson, Boris Alexandrovich,3,614,633.
Lewin, Georg-Wilhelm: *See—*
Mettig, Hermann; Hartmann, Ernst-Siegfried; and Lewin, Georg-Wilhelm,3,613,647.
Lewis, Charles Lynn, to United States of America, Army. Pneumatic resolver for missile control. 3,614,027, Cl. 244-3.22
Lewis, Gerald P.: *See—*
Gourdine, Meredith C.; Collier, Edward L.; Lewis, Gerald P.; Mc Crae, Harold; and Port, Donald H.,3,613,993.
Leybold-Heraeus-Verwaltung GmbH: *See—*
Scheidig, Helmut; Hauff, Alfred; and Reimpell, Uwe, 3,614,284.
Liberman, Harvey W.; Wade, James A.; and Voorhees, Steven C., to Dempster Brothers, Inc. Stationary packer assemblies. 3,613,569, Cl. 100-229.
Licentia Patent-Verwaltungs-G.m.b.H.: *See—*
Gruber, Ernst, 3,613,618.
Hermes, Heinz; Hinterthur, Helmut; Otto, Arnold; Thieme, Klaus Dietrich; and Westhoff, Heinz, 3,614,723.
Lichtman, Samuel W., to United States of America, Navy. Dual channel doppler frequency selective fuze system. 3,614,781, Cl. 343-7.
Lichtman, Samuel W.; and Adrian, Donald J., to United States of America, Navy. VT fuze with inherent capacity for PD action when on a normal-approach collision course. 3,613,590, Cl. 102-70.2
Lieberman, Daniel, to Sylvania Electric Products, Inc. Amplifier apparatus with distortion compensation. 3,614,644, Cl. 330-28.
Liebman, Henry F., to Bendix Corporation, The. Field effect transistor shunt squaring network. 3,614,477, Cl. 307-279.
Liggett & Myers Incorporated: *See—*
Tripodi, Peter R., 3,613,949.
Lightfoot, Richard O.; and Kunzweiler, John J., to HPE, Inc. Pump assembly. 3,614,272, Cl. 417-423.
Lindsay, Donald S.; and Little, William J., to General Electric Company. Improved circuit for providing two monostable multivibrators. 3,614,473, Cl. 307-273.
Lindstad, Jon R.; and Stoner, Thomas A., to Bucyrus-Erie Company. Automatic control for rotary drill. 3,613,805, Cl. 175-27.
Lindstadt, Theodore J., Jr.: *See—*
De Nobel, Richard W.; Schurman, Donald G.; Lindstadt, Theodore J., Jr.; and Koenig, Hans A.,3,613,619.
L'Industris Electrique De La Seine: *See—*
Canonne, Paul A. G., 3,614,689.
Lingg, Gerhard; and Welsch, Hans-Juergen, to Mannesmann-Geisel GmbH & Co. Transport system with roller tracks, containers and at least one switch for the tracks. 3,613,864, Cl. 198-38.
Lingle, Harrison C.: *See—*
Langas, Arthur; and Lingle, Harrison C.,3,613,878.
Linthicum Harley E.; and Bronne, William B., to Carrier Corporation. Rotary shaft torque limiting device. 3,613,853, Cl. 192-150.
Linz, John C. Method of synthesizing low frequency noise. 3,614,399, Cl. 235-152.
Lippmann, David Z. Easily disintegrable structures. 3,613,930, Cl. 215-32.
Lissant, Kenneth J., to Petrolite Corporation. Method of providing power with essentially non- aqueous emulsions. 3,613,372, Cl. 60-216.
Little, William J.: *See—*
Lindsay, Donald S.; and Little, William J.,3,614,473.
Litton Systems, Inc.: *See—*
Curtis, Daniel L., 3,613,775.
Littrell, Woodrow H.: *See—*
Isaak, Robert D.; and Littrell, Woodrow H.,3,614,780.
LKB-Produkter AB: *See—*
Soderkvist, Lars Olof Anton, 3,613,492.
LKB-Produkter Aktiebolag: *See—*
Soredal, Sven Gunnar, 3,614,490.
Llewellyn, Leopold W., to Kal-Pac Engineering Ltd. Internal combustion engine lubrication means. 3,613,833, Cl. 184-6.
Lobur, Walter, to Elox Inc. Electrical discharge machining short circuit protection system of the keyed type. 3,614,368, Cl. 219-69.
Lockheed Aircraft Corporation: *See—*
Antler, Harry, 3,613,250.
Kyle, Robert J.; and Meadows, Donald M., 3,614,237.
Lode, Tenny D., to Rosemount Engineering Company. Redundant system. 3,614,401, Cl. 235-153.
Loffler, Gerhard: *See—*
Moos, Franz; Loffler, Gerhard; and Brechtel, Arthur,3,614,092.
Logan, Charles H.: *See—*
Poor, John H.; and Logan, Charles H.,3,613,671.
Longcoy, Richard L., to Sperry Rand Corporation. Selective printing means including a rotatable drum having interspersed complementary character sets thereon. 3,613,574, Cl. 101-93.
Loomans, Bernard A., to Baker Perkins, Inc. Multiple orbiting screw mixing apparatus. 3,614,070, Cl. 259-102.
Loomans, Bernard A.; and Todd, David B., to Baker Perkins Inc. Variable bypass orifice or continuous mixer. 3,613,160, Cl. 18-12.
Loose, Winfield Warren: *See—*
Gudaitis, Bernard Vincent; and Loose, Winfield Warren,3,614,346.
Loper, George B., to Mobil Oil Corporation. Pneumatic acoustic source employing electro- magnetically controlled valve. 3,613,824, Cl. 181-0.5
Lopez, Jack L. Airfoil for two-wheeled vehicle. 3,614,131, Cl. 280-289.
Lopstrom, James E.: *See—*
Horwitz, Norman H.; and Cook, Kenneth J., 3,614,434.
L'Oreal: *See—*
Morane, Bruno; Paoletti, Charles; Merrien, Louis; Sathicq, Robert; and Maurelli, Manlio, 3,613,961.
Lorenz, Max R.; and Nethercot, Arthur H., Jr., to International Business Machines Corporation. Semiconductor recombination radiation device. 3,614,549, Cl. 317-234.
Lorenzini, Raymond, to Eastman Kodak Company. Manufacturing photographic webs. 3,613,531, Cl. 95-1.1
Loritz, Edward F.; and Unger, Harold W., to Continental Can Company, Inc., mesne. Closure member coating composition comprising an organosol-solution of polyvinyl chloride, acrylonitrile-butadiene copolymer, and phenolic resole resin. 3,613,613, Cl. 113-80.
Lotfallah, Lotfi H., to Gillette Company, The. Pressurizing construction. 3,614,246, Cl. 401-101.
Lott, H. A., Inc.: *See—*
Hacker, George A., 3,613,185.
Loughran, Anthony, 50% to Supermarket Service, Inc., and 50% to Greenwood & Batley Ltd. Bailing press. 3,613,567, Cl. 100-226.
Louthan, Clissolde L. Trolling underwater fishing kite. 3,613,290, Cl. 43-43.13
Loveley, Joseph D., to American Standard, Inc. Closet door having high-low return air supply for air conditioner. 3,613,776, Cl. 165-48.
Loyd, Calvin D.: *See—*
Hollenberg, Dale W.; Loyd, Calvin D.; and Satzler, Ronald L.,3,613,982.
LTV Electrosystems, Inc.: *See—*
Johnson, Richard M.; and Redmond, William G., 3,613,276.
Lucas, Joseph, (Industries) Limited: *See—*
Gilbert, Brian, 3,613,654.
Heath, Ronald Alfred, 3,613,705.
Heath, Ronald Alfred, 3,613,707.
Smith, Trevor Stanley, 3,613,362.
Lucas, Raymond J. Sleep cap. 3,613,118, Cl. 2-195.
Ludlum, Bobby R., to United States of America, Navy. Logarithmic three-color display sonar. 3,614,720, Cl. 340-3.
Lundell, Arnold W. Haircutting device. 3,613,233, Cl. 30-30.
Lundgreen, Michael W.: *See—*
Huntsinger, Dean P.; and Lundgreen, Michael W.,3,614,619.
Lutz, Kenneth V. Asphalt mixer tip. 3,614,262, Cl. 416-224.
Lyon, William E., to United States of America, National Aeronautics and Space Administration. Optical range finder having nonoverlapping complete images. 3,614,228, Cl. 356-17.
Mabeg Maschinenbau GmbH. Nachf. Hense & Pleines GmbH. Co.: *See—*
Schwebel, Aldolf, 3,614,093.
Mac Arthur, Steven J., to Information Storage Systems, Inc. Apparatus for mounting a head/arm assembly. 3,613,214, Cl. 29-200.
Macduff, Stanley I., to Bendix Corporation, The. Vehicle brake system. 3,613,839, Cl. 188-170.
MacFarlane, Thomas R.: *See—*
Bottas, Michael J.; MacFarlane, Thomas R.; and Miller, Frank E.,3,613,560.
Machek, John A. Anti-skid mechanism. 3,613,733, Cl. 137-625.65
Machek, John A., to Wegner Electric Corporation. Anti-skid mechanism. 3,614,171, Cl. 303-21.
Machmer, Wilhelm, to Diehl. Apparatus for automatically storing by means of a Program controlled shaft a product or quotient in a calculating machine. 3,613,990, Cl. 235-60.
Mackie, Harry A.; and Ross, Howard R., to Transportation Technology, Inc. Combined plenum chamber and jet curtain air cushion device. 3,613,822, Cl. 180-128.
Mackta, Leo. Fluid bifocal spectacle. 3,614,215, Cl. 351-41.
Magee, Kenneth L.; and Wilson, John F., to Case, J. I., Company. Chain bushing and method of making same. 3,614,177, Cl. 305-57.
Magnavox Company, The: *See—*
Mayle, Louis F., 3,614,570.
Magnecraft Electric Co.: *See—*
Steinback, Herbert D., 3,614,671.
Magnetech Industries, Inc.: *See—*
Rozelle, Donald S.; Rozelle, Ralph B.; and Nejib, Umid R., 3,614,692.
Mahoney, Timothy K. Artistic reflector viewer. 3,614,213, Cl. 350-299.
Maier, Rolf, to Daimler-Benz Aktiengesellschaft. Sound absorbing coating for the partition wall of a motor vehicle. 3,613,825, Cl. 181-33.
Maillet, Henry, to Compagnie Generale d'Electricite. Machine guiding system. 3,614,025, Cl. 244-3.13

Main, Ralph R.: *See—*
Ely, William Edwin; and Main, Ralph R.,3,613,851.
Malburg, Werner Adolf, to Messerschmitt-Bolkow Gesellschaft mit beschrankter Haftung. Method for covering and closing cooling channels of a combustion chamber. 3,613,207, Cl. 29-157.
Malco Manufacturing Company, Inc.: *See—*
Kukla, Frank A., 3,614,706.
Maley, Gerald A.: *See—*
Giedd, Gary R.; Maley, Gerald A.; and Perkins, Merlyn H.,3,614,608.
Malisza, Imre. Electrically heated dental wax supplying and manipulating tools. 3,614,389, Cl. 21b-421.
Malley, William G.: *See—*
Cayton, David W.; and Malley, William G.,3,613,796.
Mallory, Ray R.: *See—*
Rhyne, William A.; Mc Crory, William W., Jr.; and Mallory, Ray R.,3,613,629.
Maloney, Walter H. Retractable seat belt assembly. 3,613,819, Cl. 180-82.
Malott, Raymond A., to Shell Oil Company. Drilling mud system. 3,613,806, Cl. 175-48.
Manabe, Tosikatu; Gejyo, Tetsuo; and Hamura, Yasuzi, to Hitachi, Ltd. Plasma torch. 3,614,376, Cl. 219-121.
Mangan, Thomas R., Sr.: *See—*
Frank, Paul B.; Mangan, Thomas R., Sr.; and McFall, John C.,3,613,714.
Mann, Georg: *See—*
Wiessner, Willi; and Mann, Georg,3,613,542.
Mannel-Sanson, Francoise: *See—*
Pasquier, Claude-Marie; and Mannel-Sanson, Francoise,3,614,651.
Mannesmann Aktiengesellschaft, Firma: *See—*
Hansgen, Klaus; Kinzler, Fritz; and Spohr, Hans Werner, 3,613,139.
Mannesmann-Geisel GmbH & Co.: *See—*
Lingg, Gerhard; and Welsch, Hans-Juergen, 3,613,864.
Marathon Oil Company: *See—*
Jones, Stanley C.; Roszelle, Wayne O.; and Svaldi, Marvin A., 3,613,786.
Kirk, Walter B., 3,613,791.
Son, Marion O., Jr., 3,613,789.
Tosch, William C.; and Wenger, Charles B., 3,613,787.
Marconi Company Limited, The: *See—*
Newbould, Roderick Edward, 3,614,672.
Marinace, John C.; and McGibbon, Ralph C., to International Business Machines Corporation. Semiconductor laser device with improved operating efficiency. 3,614,550, Cl. 317-234.
Marondel, Gunther: *See—*
Gawlick, Heinz; Marondel, Gunther; Bendler, Hellmut; and Siegelin, Werner,3,613,758.
Marquardt Industrial Products Co.: *See—*
Peel, Richard V., 3,614,418.
Marquis, Richard T., 1/2 to Parker, William J. Ankle support. 3,613,273, Cl. 36-2.5
Marshall, James E.; and Henderson, Richard E., to Mattel, Inc. Voice unit backpack. 3,614,110, Cl. 274-9.
Martin, Allen N.; and Speas, John L., to Western Electric Company, Incorporated. Apparatus for testing separable magnetic cores at varying positions to one another. 3,614,603, Cl. 324-34.
Martin, Calvin F. Mounting for terracing blade. 3,613,800, Cl. 172-447.
Martin, Raymond J.; and Ulrich, Reinhard, to Bell Telephone Laboratories, Incorporated. Thin-film optical devices. 3,614,198, Cl. 350-96.
Martinez, Eugene, 1/2 to Reibel, Robert H. Stand for projector. 3,614,040, Cl. 248-11.
Marx, Thomas O., to Atwood Vacuum Machine Company. Vehicle door latch. 3,614,146, Cl. 292-216.
Marx, Walter H., to General Cable Corporation. Cordset blade design. 3,614,715, Cl. 339-252.
Masai, Hiroto, to Aisin Seiki Kabushiki Kaisha. Fluid drive coupling. 3,613,847, Cl. 192-58.
Mascarin, Guy J.: *See—*
Le Rouzic, Jean; and Mascarin, Guy J.,3,614,294.
Maschinenfabrik Hans Lange KG: *See—*
Pape, Karl-Heinz, 3,613,838.
Maschinenfabrik Hans Lenze K.G.: *See—*
Pape, Karl Heinz, 3,613,849.
Maschinenfabrik Memmingen Espanola, S.A.: *See—*
Costa, Guillermo Galceran, 3,613,348.
MaschinenfabrikSack G.m.b.H.: *See—*
Schenk, Horst; Wetter, Jakob; and Guse, Rudolf, 3,613,432.
Maskell, Clifford William Alfred, to United Kingdon Atomic Energy Authority. Non-thermionic cathode discharge devices. 3,614,510, Cl. 313-207.
Mason, Anthony, to Whirlpool Corporation. Liquid dispenser. 3,613,959, Cl. 222-187.
Mason, John L.; and Greenwood, Robert W., to Gerrett Corporation, The. Counterflow heat exchanger. 3,613,782, Cl. 165-166.
Massengill, Herman Edward, Jr.: *See—*
Shuford, Emir H., Jr.; and Massengill, Herman Edward, Jr.,3,613,260.
Math, Irwin, to International Patents & Development Corporation. Refuse compactor control arrangement. 3,613,558, Cl. 100-35.
Mathias, Richard G.: *See—*
Baker, Theodore C.; Bode, Wolfgang W.; Mathias, Richard G.; Nolan, James F.; and Pfaender, Lawrence V.,3,614,511.
Mathisen, Einar S., to International Business Machines Corporation. Pattern defect sensing using error free blocking spacial filter. 3,614,232, Cl. 356-71.
Matsui, Isao; Minamikawa, Yoshihisa; and Katagiri, Shinjiro, to Hitachi, Ltd. Surge reduction resistors between a high voltage source and an electron microscope electron gun. 3,614,422, Cl. 250-49.5
Matsui, Masao; and Yamabe, Masahiro, to Kanegafuchi Boseki Kabushiki Kaisha. Mix-spinning apparatus. 3,613,173, Cl. 18-8.
Matsumoto, Tohru; and Kazamaki, Tomokazu, to Asahi Kogaku Kogyo Kabushiki Kaisha. Unity magnification symmetrical lens system. 3,614,208, Cl. 350-214.
Matsuoka, James T., to Intercole Automation, Inc. Roll mill and temperature controlled roll. 3,614,390, Cl. 219-469.
Matsushima, Hiroshi: *See—*
Hasegawa, Seiro; and Matsushima, Hiroshi,3,614,436.
Matsushita Denko Kabushiki Kaisha: *See—*
Suzuki, Yasuo; and Kameyama, Yasuyoshi, 3,614,495.
Matsushita Electric Industrial Co., Ltd.: *See—*
Fujimoto, Kyohei; and Suyama, Nobuyuki, 3,614,729.
Hamano, Goro; and Someda, Sadamichi, 3,614,405.
Hasegawa, Seiro; and Matsushima, Hiroshi, 3,614,436.
Sasabe, Kaoru; and Kotera, Hiroaki, 3,614,307.
Shimokusu, Kazuo; Korekawa, Takashi; Hosokawa, Tomoyuki; Yamamoto, Taro; and Kobayasi, Takao, 3,613,405.
Yamamoto, Kozo; and Naito, Morihisa, 3,614,109.
Yawata, Yasuro; and Nakae, Nobuhiro, 3,614,184.
Matsushita Electronics Corporation: *See—*
Inoue, Morio, 3,614,548.
Mattel, Inc.: *See—*
Baynes, William R.; and Kaminski, Stephen H., 3,613,307.
Marshall, James E.; and Henderson, Richard E., 3,614,110.
Maugel, Theodore R.: *See—*
Morgan, Albert R., Jr.; Antoun, Paul R.; Callahan, Howard E.; and Maugel, Theodore R.,3,613,328.
Mauger, Roy Harold; and Frampton, John Michael, to Plessey Company Limited, The. Monitoring circuits. 3,614,735, Cl. 340-146.1
Mauk, Robert W.: *See—*
Conn, Harry; Mauk, Robert W.; and Lancaster, Paul M.,3,613,493.
Maurelli, Manlio: *See—*
Morane, Bruno; Paoletti, Charles; Merrien, Louis; Sathicq, Robert; and Maurelli, Manlio,3,613,961.
May, John E., to General Electric Company. Tungsten barrier electrical connection. 3,614,547, Cl. 317-234.
Mayer & Cie Maschinenfabrik: *See—*
Plath, Ernst-Dieter, 3,613,404.
Mayer, Klaus. Revolver with double action. 3,613,286, Cl. 42-65.
Mayes, Richard T.: *See—*
Dent, Robin W.; Oatfield, John C.; and Mayes, Richard T.,3,613,445.
Mayfab, Inc.: *See—*
Davis, Michael, 3,613,843.
Mayhew, Delbert J., to Minnesota Mining and Manufacturing Company. Filtration mask. 3,613,678, Cl. 128-146.2
Mayle, Albert T., Jr., to International Telephone and Telegraph Corporation. Master-slave, tuned channels for simultaneous tracking of plural signals of different frequencies. 3,614,625, Cl. 325-307.
Mayle, Louis F., to Magnavox Company, The. Simplified wire remote control of small motors. 3,614,570, Cl. 318-486.
Maytag Company, The: *See—*
Smith, Thomas R., 3,613,253.
Mazzola, Sergio J.: *See—*
Ciampa, Fred A.; and Mazzola, Sergio J.,3,614,266.
Mazzone, Charles P.; and Pike, Herbert J., to Stevens, J. P., & Co., Inc. Apparatus for producing sculptured effects on pile fabrics. 3,613,186, Cl. 26-2.
McAuliffe, Gerald K., to North American Rockwell Corporation. Adaptive system for correction of distortion of signals in transmission of digital data. 3,614,623, Cl. 325-42.
McCabria, Jack L.: *See—*
Scheffler, Paul H.; and McCabria, Jack L.,3,614,258.
McCaldin, James: *See—*
Jenkins, Robert; Mead, Carver A.; and McCaldin, James,3,614,551.
McCarty, Lewis C., Jr., to Central Aircraft Manufacturing Company, Inc. Tandem wing aircraft with freely pitching wing surfaces. 3,614,033, Cl. 244-48.
Mc Closkey, Joseph C.: *See—*
Miller, Bernard; and Mc Closkey, Joseph C.,3,614,428.
McCloud, James R.: *See—*
Meier, Henry G.; and McCloud, James R.,3,614,356.
McConnell, John R. Overall processing of structural members. 3,613,204, Cl. 29-155.
McCormick, Thomas C., 50% to Neufeld, John P. Cable ripper. 3,613,235, Cl. 30-91.1
Mc Coy, Frederic C.: *See—*
Knowles, Edwin C.; and Mc Coy, Frederic C.,3,613,658.
Mc Crae, Harold: *See—*
Gourdine, Meredith C.; Collier, Edward L.; Lewis, Gerald P.; Mc Crae, Harold; and Port, Donald H.,3,613,993.

McCreary Industrial Products Company, Inc.: *See*—
Meyer, Leonard S., 3,613,200.

Mc Crory, William W., Jr.: *See*—
Rhyne, William A.; Mc Crory, William W., Jr.; and Mallory, Ray R.,3,613,629.

McCulloch Corporation: *See*—
Burkett, Wilford B.; and Bigbee, John H., III, 3,614,582.
Burkett, Wilford B.; and Jackson, Robert V., 3,614,583.
Burkett, Wilford B.; and Bigbee, John H., III, 3,614,584.

McCulloch, Roger L., to Boise Cascade Corporation. Dispensing package and container therefor. 3,613,956, Cl. 222-136.

McCurnin, Thomas W.; and Perper, Lloyd J., to United States of America, Navy, mesne. Simulation device. 3,613,259, Cl. 35-1.

Mc Dermott, Ray J., & Co., Inc.: *See*—
Cox, Dwight J., 3,613,381.

Mc Donald, Emery L., 1/2 to Volk, Anthony J. Tendon pulling machine. 3,613,153, Cl. 17-11.3

McDonnell Douglas Corporation: *See*—
Goodell, Stuart E.; and Stoeckinger, Gerald R., 3,614,378.
Kleckner, Harold F., 3,614,028.

Mc Donnell Douglas Corporation: *See*—
Borrok, Martin J.; Perkinson, Robert E.; Watson, Fred D.; and Von Fange, Wilbur H., 3,614,728.

McDonnell, Thomas J.: *See*—
Kelly, Hubert K.; McDonnell, Thomas J.; and Lamkin, Richard C.,3,613,485.

McElroy, Arthur H. Rolled groove fin tube. 3,613,206, Cl. 29-157.3

McFadin, Louis W., to United States of America, National Aeronautics and Space Administration. Platinum resistance thermometer circuit. 3,613,454, Cl. 73-362.

McFall, John C.: *See*—
Frank, Paul B.; Mangan, Thomas R., Sr.; and McFall, John C.,3,613,714.

McFarland, Gordon B., Jr., to Research Corporation. Flexor tendon prosthesis. 3,613,120, Cl. 3-1.

McFarland, Harold L., Jr.; and O'Loughlin, James F., to Digital Equipment Corporation. Data processing system with instruction addresses identifying one of a plurality of registers including the program counter. 3,614,741, Cl. 340-172.5

McFarland, Harold L., Jr.: *See*—
Delagi, Bruce A.; McFarland, Harold L., Jr.; and O'Loughlin, James F.,3,614,740.

McGibbon, Ralph C.: *See*—
Marinace, John C.; and McGibbon, Ralph C.,3,614,550.

McGraw-Edison Company: *See*—
Douglass, James D.; and Chase, Albert T., 3,614,696.
Fister, Aloysius J., 3,614,699.

McHenry, Thomas F.: *See*—
United States of America,National Aeronautics and Space Administration, Administrator, 3,614,431.

McInnis, Andrew M., to California Computer Products, Inc., mesne. Drafting machine pen conditioner. 3,613,248, Cl. 33-18.

Mc Intosh, Robert P.; and Padalino, Marco, to International Business Machines Corporation. Magnetic record with servo track perpendicular to information track. 3,614,756, Cl. 240-174.1

McKee, John B.: *See*—
Olsen, Willy; McKee, John B.; and Pahel, William M.,3,613,229.

McKinley, Larry E.; and Evans, William E., to United States of America, Navy. Oceanographic observation platform. 3,613,621, Cl. 114-66.

McKinstry, William S. Flushing apparatus for a water closet. 3,613,121, Cl. 4-40.

McLaughlin, John A.; and Raviv, Josef, to International Business Machines Corporation. Pattern recognition apparatus and methods invariant to translation, scale change and rotation. 3,614,736, Cl. 340-146.3

McLean, William B.: *See*—
Pearson, John; McLean, William B.; and Cosner, Lawrence N.,3,613,581.

Mc Naghten, Delmar E.: *See*—
Beard, Lloyd R.; Mc Naghten, Delmar E.; and Popeck, Charles A.,3,614,700.

McNair, Robert J.: *See*—
Weller, Carroll E.; and McNair, Robert J.,3,614,665.

McNaughton, Kenneth Eugene; McNaughton, Richard Lee; and Morrissette, Arthur E. Automatic subscriber answering service. 3,614,328, Cl. 179-15.

McNaughton, Richard Lee: *See*—
McNaughton, Kenneth Eugene; McNaughton, Richard Lee; and Morrissette, Arthur E.,3,614,328.

Mc Roberts, Richard C.; and Arnold, Bruce C., to Twin Disc, Incorporated. Power transmission of the hydraulically actuated, friction clutch type. 3,613,469, Cl. 74-361.

Mead, Carver A.: *See*—
Jenkins, Robert; Mead, Carver A.; and McCaldin, James,3,614,551.

Meadows, Donald M.: *See*—
Kyle, Robert J.; and Meadows, Donald M.,3,614,237.

Measurex Corporation: *See*—
Hill, Robert Curtis; French, John M.; and Toepfer, Richard E., 3,614,450.

Mechanical Technology Incorporated: *See*—
Be Vier, William E.; and Wagner, Rolf E., 3,614,631.

MECI-Materiel Electrique de Controle et Industriel: *See*—
Midy, Michel, 3,613,463.

Medley, John A., to Wool Industries Research Association. Method of and apparatus for cutting cloth. 3,614,369, Cl. 219-10.43

Meeks, Crawford R., to United States of America, Air Force. Magnetic bearing for combined radial and thrust loads. 3,614,181, Cl. 308-10.

Mehal, Edward W.: *See*—
Haisty, Robert W.; Johnson, Rowland E.; and Mehal, Edward W.,3,613,226.

Meier, Henry G.; and McCloud, James R., to I-T-E Imperial Corporation. Shield assembly for high voltage gas circuit breaker. 3,614,356, Cl. 200-148.

Meijer, Roelf Jan, to U.S. Philips Corporation, mesne. Device for converting calorific energy into mechanical energy. 3,613,358, Cl. 60-24.

Meissner, Willi; and Wieltsch, Horst, to Teleflex Gesellschaft mit beschrankter Haftung. Windshield wiper arrangement. 3,613,148, Cl. 15-250.29

Meitl, Harold G.: *See*—
Pool, Stuart D.; Meitl, Harold G.; Rickerd, Calvin P.; Middlesworth, Tommy A.; Findlay, Jack B.; Thayer, Arlie J.; and Svereika, Edward,3,613,342.

Melchior, Frederick C. Fluid pressure sensing instrument. 3,613,514, Cl. 92-48.

Mercer, Robert E.: *See*—
Turner, William L.; Campbell, William H.; and Mercer, Robert E.,3,614,155.

Merenda, Adrien, to Ateliers de Constructions Mecaniques de Vevey S.A. Hydro-electric installation. 3,614,268, Cl. 417-237.

Merrien, Louis: *See*—
Morane, Bruno; Paoletti, Charles; Merrien, Louis; Sathicq, Robert; and Maurelli, Manlio,3,613,961.

Mesheingisser, Mikhail Yakovlevich; Ermakov, Ivan Semenovich; Kochkin, Georgy Mikhailovich; Stankun, Alexandr Viktorovich; Shakhov, Filipp Nikolaevich; Velednitsky, Ilya Pinkhusovich; and Yagodin, Petr Petrovich. Filter press. 3,613,563, Cl. 100-115.

Messerschmitt-Bolkow Gesellschaft mit beschrankter Haftung: *See*—
Malburg, Werner Adolf, 3,613,207.

Mettig, Hermann; Hartmann, Ernst-Siegfried; and Lewin, Georg-Wilhelm, to Klockner-Humboldt-Deutz Aktiengesellschaft. Apparatus for actuating a plurality of valves of piston operated internal combustion engines. 3,613,647, Cl. 123-90.22

Meyer, Dietrich, to U.S. Philips Corporation. Circuit arrangement for converting a resistance variation into a proportional admittance variation. 3,614,598, Cl. 323-75.

Meyer, Engelbert A., to Warren Fastener Corporation. Impact gun and method of forming a structural connection. 3,613,431, Cl. 72-369.

Meyer, Leonard S., to McCreary Industrial Products Company, Inc. Reinforced plastic shell structures and methods and means for constructing the same. 3,613,200, Cl. 29-132.

Meylink, John Gary; and Bishop, Robert James, to Deere & Company. Tractor and implement assembly. 3,613,815, Cl. 180-53.

Michel, Rolf: *See*—
Schwarzenberg, Karl-Heinz; and Michel, Rolf,3,613,429.

Michigan Research Corporation: *See*—
Hill, Charles C.; and Romberger, Frank, 3,613,242.

Midby, Bo. Fence for enclosing impurities floating on water. 3,613,376, Cl. 61-1.

Middlesworth, Tommy A.: *See*—
Pool, Stuart D.; Meitl, Harold G.; Rickerd, Calvin P.; Middlesworth, Tommy A.; Findlay, Jack B.; Thayer, Arlie J.; and Svereika, Edward,3,613,342.
Rickerd, Calvin P.; and Middlesworth, Tommy A.,3,613,868.

Midy, Michel, to MECI-Materiel Electrique de Controle et Industriel. Device for providing mechanical transmission through the wall of an enclosure. 3,613,463, Cl. 74-18.1

Mierendorf, Robert E., to Harnischfeger Corporation. Control for electromechanical brake. 3,614,565, Cl. 318-203.

Mighton, Perciptimus J., to Harter, Mary C. Pipe machining method. 3,613,320, Cl. 51-290.

Miller, Anthony Stanley, Jr. Clothing rack. 3,613,896, Cl. 211-107.

Miller, Bernard; and Mc Closkey, Joseph C., to Westinghouse Electric Corporation. X-ray apparatus having means for directing an image to either of two different cameras. 3,614,428, Cl. 250-65.

Miller, Charles D., to Carrier Corporation. Tap for removing tubes from tube sheets. 3,613,212, Cl. 29-202.

Miller, Donald F.: *See*—
Bentley, Thomas P.; and Miller, Donald F.,3,613,999.

Miller, Frank E.: *See*—
Bottas, Michael J.; Difley, Charles R.; and Miller, Frank E.,3,613,568.
Bottas, Michael J.; MacFarlane, Thomas R.; and Miller, Frank E.,3,613,560.

Miller, Harmon B., to Reclosable Package Corporation. Reclosable package. 3,613,874, Cl. 206-46.

Miller, Herman Keith: *See*—
Isola, Richard A.; and Miller, Herman Keith,3,613,133.

Millman, Victor, to Rohr Corporation. Combined water surface and aircraft. 3,614,024, Cl. 244-2.

Minami, Shigeo, to Hitachi, Ltd. Analog data accumulator providing improved signal- to-noise ratio. 3,614,337, Cl. 179-100.

Minamikawa, Yoshihisa: *See*—
Matsui, Isao; Minamikawa, Yoshihisa; and Katagiri, Shinjiro,3,614,422.

Minnesota Mining and Manufacturing Company: *See—*
Fritts, Robert W., 3,614,727.
Kittredge, John B.; and Larson, Richard L., 3,613,317.
Mayhew, Delbert J., 3,613,678.
Muir, Wilfred L., 3,613,951.
Nestor, Leonard R., 3,614,140.

Minnich, Violet C.; and Krueger, Walter J., to United States of America, Army. Missile cover and method of making the cover. 3,613,191, Cl. 29-1.4

Minolta Camera Kabushiki Kaisha: *See—*
Kuramoto, Yoshio; and Kobori, Toshio, 3,614,013.

Miotti, Giosue, to I. C. O. S. Impresa Costruzioni Opere Specializzate S p. A. Trenching in rocky soils. 3,614,161, Cl. 299-10.

Mita, Kunio; and Umemura, Yukio, to Asahi Kogaku Kogyo Kabushiki Kaisha. Viewfinder shield for a camera with a self-timer. 3,613,543, Cl. 95-42.

Mitsubishi Denki Kabushiki Kaisha: *See—*
Shigeura, Junichi, 3,613,395.

Mitsui Shipbuilding and Engineering Co., Ltd.: *See—*
Suzuki, Hideo, 3,613,623.

Miyaoka, Senri; and Morio, Minoru, to Sony Corporation. Misconvergence compensation for single-gun, plural- beam type color TV picture tube. 3,614,500, Cl. 313-69.

Miyaoka, Senri: *See—*
Ohgoshi, Akio; and Miyaoka, Senri,3,614,501.

Miyata, Saburo. Device for treating hydrocarbon fuel. 3,614,691, Cl. 335-306.

MKH, Inc.: *See—*
Hoekstra, Evert M., 3,614,331.

Mobil Oil Corporation: *See—*
Childs, Elbert B., 3,614,762.
Jensen, David R., 3,614,042.
Loper, George B., 3,613,824.

Mognetti, Charles: *See—*
Drevard, Michel; Mognetti, Charles; and Vermot, Andre,3,613,396.

Mohan, Chandra; Rihal, Gursharan Singh; and Devgun, Balbir Singh, to Scientific and Industrial Research, Council of. Hydraulic control system for agricultural implements. 3,613,798, Cl. 172-9.

Mohr, Robert G., to Tiffany Industries, Inc., mesne. Chair ganging device. 3,614,158, Cl. 297-248.

Moller, Paul S. Aircraft. 3,614,030, Cl. 244-23.

Mollman, Robert E., to Alside International Corporation. Preformed simulated brick panel having stepped edges. 3,613,326, Cl. 52-314.

Molnlycke Aktiebolag: *See—*
Dahlsten, Gunnar, 3,613,688.

Monchamp, Roch R.; Weber, Marvin J.; and Bass, Michael, to Raytheon Company. Laser with a monocrystalline $YalO_3$: Nd^0_3 active medium. 3,614,662, Cl. 331-94.5

Monogram Industries, Inc.: *See—*
Juhasz, Daniel P., 3,613,751.

Monsanto Company: *See—*
Dent, Robin W.; Oatfield, John C.; and Mayes, Richard T., 3,613,445.
Jenkins, Robert; Mead, Carver A.; and McCaldin, James, 3,614,551.
Jope, Bruce T.; and Witkowski, Leonard J., 3,613,979.
Kulig, Frank M.; and Layman, Lee R., 3,613,980.
Mottern, John W.; Cunningham, Robert E.; and Bell, Robert P., 3,613,158.
Paterson, James G. T., 3,613,408.
Tapp, James S.; Colwell, Robert E.; and Toney, Myron K., 3,613,988.
Wetherell, Richard B., Jr., 3,613,955.

Monson, Charles D., to Inventors Engineering, Inc. Material handling system. 3,613,924, Cl. 214-313.

Montanino, Louis N.; and Pearson, William E., to United States of America, Air Force. Self-sustained attitude control system. 3,614,026, Cl. 244-3.22

Monte, Matthew Sallee, to AMF Incorporated. Reconstituted tobacco. 3,613,693, Cl. 131-140.

Montelius, George Alfred. Surgical instrument support device. 3,613,901, Cl. 211-166.

Moody, Elvin C., to Forest City Foam Products, Inc. Container body. 3,613,761, Cl. 150-52.

Moore Dry Kiln Company of Oregon: *See—*
Wellford, Walker L., Jr., 3,614,074.

Moore, Edward H.; and Aron, Milton A., to Gems Company, Inc., The. Indicating apparatus. 3,614,759, Cl. 340-212.

Moore, George G.: *See—*
Chapman, Ronald H.; and Moore, George G.,3,614,621.

Moore, Lee C., Corporation: *See—*
Woolslayer, Homer J.; Woolslayer, Joseph R.; Jenkins, Cecil; and Campbell, Erwin A., 3,613,905.

Moos, Franz, to Schnellpressenfabrik Frankenthal, Albert & Cie. Apparatus for aligning printing forms. 3,613,252, Cl. 33-184.5

Moos, Franz; Loffler, Gerhard; and Brechtel, Arthur, to Schnellpressenfabrik Frankenthal Albert & Cie. Aktiengesellschaft. Sheet transfer mechanism for sheet fed rotary printing presses. 3,614,092, Cl. 271-52.

Moran, James H., to Schlumberger Technology Corporation. Continuously variable steered beam transducers for acoustic well logging. 3,614,725, Cl. 340-17.

Morane, Bruno; Paoletti, Charles; Merrien, Louis; Sathicq, Robert; and Maurelli, Manlio, to L'Oreal. Dispensing container. 3,613,961, Cl. 222-389.

Morgan, Albert R., Jr.; Antoun, Paul R.; Callahan, Howard E.; and Maugel, Theodore R., to Panacon Corporation. Laminated strip shingle with multiple extended shadow-producing tabs of variable width and length. 3,613,328, Cl. 52-555.

Morgan, Allan C., to Cabot Corporation. High combustion rate burner. 3,614,283, Cl. 431-352.

Moriceau, Pierre; and Baudet, Jean Pierre, to Deere & Company. Hydraulic clamping apparatus and pivotal mounting for a side shiftable mechanical digger slide frame. 3,614,134, Cl. 280-456.

Morio, Minoru: *See—*
Miyaoka, Senri; and Morio, Minoru,3,614,500.

Morita, Akiyoshi: *See—*
Hidaka, Tsuneyoshi; Morita, Akiyoshi; Honjo, Yoshihiko; and Nishimura, Takashi,3,614,305.

Morotta Scientific Controls, Inc.: *See—*
Worden, Donald A., 3,613,520.

Morris, Philip, Incorporated: *See—*
Kemble, Mern S., 3,613,879.
Knight, Jack B., 3,613,975.

Morrison, Howard J.; and Glass, Marvin I., to Glass, Marvin, & Associates. Balancing puzzle device. 3,614,106, Cl. 273-156.

Morrissette, Arthur E.: *See—*
McNaughton, Kenneth Eugene; McNaughton, Richard Lee; and Morrissette, Arthur E.,3,614,328.

Mosebach, Wolfgang; and Piper, Christopher Peter, to International Standard Electric Corporation. Solid electrolytic capacitors having an additional insulated layer formed on the dielectric layer. 3,614,544, Cl. 317-230.

Moser, Werner: *See—*
Mutz, Gerhard; Hettich, Bernhard; and Moser, Werner,3,614,094.

Moss, Norman; and Broad, Michael John, to Plessey Company Limited, The. Fuel-injection systems for internal- combustion engines fed with a fuel-and-air mixture. 3,613,649, Cl. 123-119.

Motionetics, Inc.: *See—*
Vitka, Joseph A.; and Murphy, James D., 3,613,264.

Motorola, Inc.: *See—*
Chapman, Ronald H.; and Moore, George G., 3,614,621.
Lace, Melvin A., 3,614,593.
Ruthenberg, Ross E.; and Evitts, James C., Jr., 3,614,470.

Mottern, John W.; Cunningham, Robert E.; and Bell, Robert P., to Monsanto Company. Orifice assembly for spinning low viscosity melts. 3,613,158, Cl. 18-8.

Motts, Paul V.; and Stoops, Wayne K., to Robertson, H. H., Company. Air mixing valve assembly. 3,613,548, Cl. 98-38.

Moyer, Harris P., to Unarco Industries, Inc. Self rimming porcelain enameled sink. 3,613,128, Cl. 4-187.

Mozey, William B., Jr. Bayonet and utility knife. 3,613,283, Cl. 42-86.

Muchnik, Vladimir Semenovich; Chermensky, German Petrovich; Nikiforov, Mikhail Andreevich; and Gaiduk, Jury Vladimirovich. Device for building-up fluid pressure pulses. 3,614,271, Cl. 417-379.

Muhler, Joseph C.; and Stookey, George K., to Indiana University Foundation. Brush with abrasive-impregnated bristles. 3,613,143, Cl. 15-167.

Muir, Wilfred L., to Minnesota Mining and Manufacturing Company. Pneumatically controlled dispensing system. 3,613,951, Cl. 222-36.

Mulhern, John E., Jr.; and Harris, Dwight M., to United States of America, National Aeronautics and Space Administration. Recorder using selective noise filter. 3,614,343, Cl. 179-100.2

Mulitz, Lewis, to Potomac Iron Works, Inc. Vehicle parking equipment. 3,613,908, Cl. 214-16.1

Muller, Ludwig. Connector for securing an elongate member to a construction pile. 3,614,142, Cl. 287-108.

Muller, Roger, to Etablissements D.F. Apparatus for a settable working material feed in form of cycles. 3,613,565, Cl. 100-215.

Multimatic Displays, Inc.: *See—*
Rose, Robert Joseph; and Sanders, Frank Wilson, 3,613,277.

Munnerlyn, Charles R. Diffraction grating interferometer. 3,614,235, Cl. 356-106.

Murch, Walter G.: *See—*
Quinn, John S.; and Murch, Walter G.,3,613,991.

Murphy, James D.: *See—*
Vitka, Joseph A.; and Murphy, James D.,3,613,264.

Murry, Edward J., to Fibra-Sonics, Inc. Multiple frequency ultrasonic method and apparatus for improved cavitation, emulsification and mixing. 3,614,069, Cl. 259-1.

Muscatell, Frank L.: *See—*
Deverell, Harry E.; and Muscatell, Frank L.,3,613,433.

Muscott, Ted. Plug for openings in cadavers. 3,613,188, Cl. 27-21.

Muth, Gregor Nikolaus; and Wolfram, Karl-Heinz, to Schnellpressenfabrik Koenig & Bauer Aktiengesellschaft. Central control system for ink duct adjusting screws on printing presses. 3,613,576, Cl. 101-181.

Mutz, Gerhard; Hettich, Bernhard; and Moser, Werner, to Kienzle Apparate GmbH. Data processing and card assorting apparatus. 3,614,094, Cl. 271-59.

Myers, Robert A.: *See—*
Lean, Eric G.; Myers, Robert A.; and Pennington, Keith S.,3,614,462.

Nadezhnikov, Nikita Mikhailovich: *See—*
Folivorov, Vladimir Kikhailovich; Ukraintsev, Boris Nikolaevich; Sirotenko, Georgievich; Tinte, Aivar Eduardovich; Birger, Boris Lvovich; Vilnitis, Aivar Yanovich; Nadezhnikov, Nikita Mikhailovich; and Grinshteen, Mark Ilich,3,614,080.

Nagasaki, Motohiro. Electromagnetic sterophonic phonograph pick-up. 3,614,332, Cl. 179-100.41

Nagatoshi Suzuki: *See—*
Yamaguchi, Kenichi, 3,613,412.

Naito, Morihisa: *See—*
Yamamoto, Kozo; and Naito, Morihisa,3,614,109.

Nakae, Nobuhiro: *See—*
Yawata, Yasuro; and Nakae, Nobuhiro,3,614,184.

Nakamura, Makoto, to Nippon Kogaku K.K. Film counter change-over device for different kinds of film having different frames. 3,613,540, Cl. 95-31.

Nakamura, Masanobu. Bulging apparatus. 3,613,423, Cl. 72-58.

Nakamura, Tadahiko: *See—*
Kojima, Koichi; and Nakamura, Tadahiko,3,614,524.

Nakamura, Tetsuji, to Tokyo Shibaura Electric Co., Ltd. Magneto sensitive semiconductor switching device. 3,614,556, Cl. 317-235.

Nanevicz, Joseph E., to United States of America, Air Force. Low-noise corona discharge device. 3,614,529, Cl. 317-2.

Nara, Akinao; and Ono, Masahisa, to Sumitomo Metal Industries, Ltd, and Hitachi, Ltd. Automatic control system for hot strip mill and the like. 3,613,418, Cl. 72-8.

Nara, Jiyuichi. Heat exchange apparatus for powdered materials. 3,613,777, Cl. 165-86.

Narisawa, Hiroshi, to Hitachi, Ltd. Memory circuit. 3,614,751, Cl. 340-173.

National Cash Register Company, The: *See—*
Coleman, William E.; and Skutt, Robert R., 3,614,769.
Harshman, Everett E., 3,614,395.
Janning, John L., 3,614,526.
Janning, John L., 3,614,750.
Scarpino, Frank A., 3,614,624.
Schrader, George F.; and Vaiciunas, Alvinas A., 3,614,618.

National Research Development Corporation: *See—*
Kerr, John; and Lasbrey, Ian, 3,613,821.

Naumann, Robert J.; and Jex, David W., to United States of America, National Aeronautics and Space Administration. Liquid aerosol dispenser. 3,613,794, Cl. 169-28.

Naylor, Richard Norman, to Concept, Inc. Disposable cauteries. 3,613,682, Cl. 128-303.1

Nederlandse Organisatie voor Toegepast-Natuurweten- Schappelijk Onderzoek Ten Behoeve Van Nijverheid Handel en Verkeer: *See—*
Platzek, Paul; Van Kempen, Gerardus Adrianus; and Ros, Dominicus, 3,614,445.

Neff, Joseph J., to Cummins Engine Company, Inc. Turbine casing. 3,614,259, Cl. 415-205.

Nejib, Umid R.: *See—*
Rozelle, Donald S.; Rozelle, Ralph B.; and Nejib, Umid R.,3,614,692.

Nelson, David E., to DeZurik Corporation. Power supply and signal conditioner for electroner for electronic instrumentation. 3,614,479, Cl. 307-297.

Nelson, Ted, Company: *See—*
Beasley, Robert W., 3,614,054.

Nemeth, Bela J.; and Boeckeler, Benjamin Clark, to Kennametal Inc. Piston construction for high pressure apparatus. 3,613,164, Cl. 18-16.5

Neptune Meter Company: *See—*
Clements, Thomas C., 3,614,774.

Nestor, Leonard R., to Minnesota Mining and Manufacturing Company. Gripping device and method of making. 3,614,140, Cl. 287-52.06

Nethercot, Arthur H., Jr.: *See—*
Lorenz, Max R.; and Nethercot, Arthur H., Jr.,3,614,549.

Neufeld, John P.: *See—*
McCormick, Thomas C., 3,613,235.

Neuser, Ernst: *See—*
Schneider, Felix; Wagener, Paul-Werner; Neuser, Ernst; and Walser, Rudolf,3,613,311.

New Mexico Chili Company: *See—*
Riggs, Ernest, 3,613,339.

New Nippon Electric Company Ltd.: *See—*
Ito, Saburo; and Ezaki, Shingo, 3,614,508.

Newbould, Roderick Edward, to Marconi Company Limited, The. Waveguide couplers. 3,614,672, Cl. 333-10.

Newell, Francis Lee. Hair removal tool. 3,613,690, Cl. 128-355.

Newstead, Charles, to Girling Limited. Locking means for vehicle wheel brakes. 3,613,841, Cl. 188-265.

Newton, Henry Lynn: *See—*
Roberts, Walter L.; and Newton, Henry Lynn,3,614,323.

Newton, Robert F.; and Csapo, Tibor J., to Heald Machine Company, The. Machine tool. 3,613,224, Cl. 29-568.

Nichols, Gerald L., to Ace Filtercraft Inc. Porous metal panel to distribute de-icing fluid onto the leading edge of a surface. 3,614,038, Cl. 244-134.

Nichols, William A.; and Simpson, Ralph E. Tape dispensing means. 3,614,014, Cl. 242-75.2

Nickola, Anne D. Mounting pedestal for utilities. 3,614,538, Cl. 317-99.

Nicolai, Van O., to United States of America, Navy. Optical windows for lasers. 3,614,652, Cl. 331-94.5

Nicolet, Marc-Aurele; and Bilger, Hans Rudolf, to California Institute of Technology. Double injection inductor. 3,614,679, Cl. 333-80.

Nihon Denshi Kabushiki Kaisha: *See—*
Hattori, Shuzo, 3,614,657.

Nikex Nehezipari Kulkereskedelmi Vallalat: *See—*
Gabor, Laszlo, 3,614,282.

Nikiforov, Mikhail Andreevich: *See—*
Muchnik, Vladimir Semenovich; Chermensky, German Petrovich; Nikiforov, Mikhail Andreevich; and Gaiduk, Jury Vladimirovich,3,614,271.

Nikoden, Joseph, Sr., to Detroit Bullet Trap Corporation. Automatic target control system. 3,614,102, Cl. 273-105.6

Nikolsky, Gennady Georgievich: *See—*
Belopolsky, Anatoly Ovseevich; Evdokimov, Jury Pavlovich; Vexelman, Garald Lvovich; Nikolsky, Gennady Georgievich; and Pchelin, Vitaly Pavlovich,3,613,256.

Nilsson, Erland: *See—*
Johansson, Bengt; and Nilsson, Erland,3,614,536.

Nippon Electric Company, Limited: *See—*
Sakaguchi, Mituhito; and Nishida, Nobuo, 3,614,191.
Sudoh, Toshiaki, 3,614,668.

Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Amano, Takehisa, 3,614,288.

Nippon Hoso Kyokai: *See—*
Konishi, Yoshihiro, 3,614,675.

Nippon Kogaku K.K.: *See—*
Fujii, Tatsuo; and Watano, Yutaka, 3,614,704.
Nakamura, Makoto, 3,613,540.

Nippon Seiko Kabushiki Kaisha: *See—*
Okoshi, Hideo, 3,613,397.

Nirschl, Joseph C., to United States of America, Army. Radiation survey meter with dose rate and dosimeter readout. 3,614,444, Cl. 250-83.6

Nishida, Nobuo: *See—*
Sakaguchi, Mituhito; and Nishida, Nobuo,3,614,191.

Nishimoto, Tetsunori: *See—*
Ishihara, Koichiro; and Nishimoto, Tetsunori,3,614,747.

Nishimura, Takashi: *See—*
Hidaka, Tsuneyoshi; Morita, Akiyoshi; Honjo, Yoshihiko; and Nishimura, Takashi,3,614,305.

Nishioka, Masakatu, to Oval Kiki Kogyo Kabushiki Kaisha. Method of finishing a displacement chamber in a rotary fluid device. 3,614,249, Cl. 408-1.

Nishizawa, Jun-Ichi; Kawakami, Shojiro; and Kiyasu, Zen'iti, to Semiconductor Research Foundation. Solid optical wave guide having a radially varying refractive index. 3,614,197, Cl. 350-96.

Noble, David S.: *See—*
Hinerfeld, Norman M.; Noble, David S.; and Bartley, William H.,3,613,608.
Hinerfeld, Norman M.; Noble, David S.; and Bartley, William H.,3,613,610.

Noble, Sid; and Gilder, George. Toy puppet-like figurine with accessorits. 3,613,301, Cl. 46-154.

Nolan, James F.: *See—*
Baker, Theodore C.; Bode, Wolfgang W.; Mathias, Richard G.; Nolan, James F.; and Pfaender, Lawrence V.,3,614,511.

Nolan, Thomas J., III: *See—*
Stout, Caleb; Smith, Charles F.; and Nolan, Thomas J., III,3,613,790.

Norberg, Lars Arvid, to Stal-Laval Turbin Aktiebolag. Device for automatically adjusting the effective length of a stay or support. 3,614,039, Cl. 248-2.

Nordstrom, Rolf E.: *See—*
Holst, Jan-Olov M.; Nordstrom, Rolf E.; and Ekenberg, Christer U.,3,614,176.

Norfleet, John H. Wall surface scraper tool. 3,613,147, Cl. 15-236.

Norman Industries, Inc.: *See—*
Horberg, Charles, Jr., 3,613,538.

Normos, Norbert, to Societe de Conditionnement en Aluminum Scal GP. Method and apparatus for shaping bottles. 3,613,424, Cl. 72-103.

North American Rockwell Corporation: *See—*
Farrand, William A., 3,614,541.
Gage, Arthur F., 3,613,983.
Hobbs, Milo Oldell, 3,613,666.
McAuliffe, Gerald K., 3,614,623.
Palanos, Paul N., 3,614,663.
Warren, Francis A.; and Britton, Sylvester C., 3,613,597.

Northrop Corporation: *See—*
Feldman, Karl T., Jr., 3,613,778.

Northrop Weaving Machine Limited: *See—*
Ainsworth, David; and Atkinson, Cyril Millward, 3,613,742.
Atkinson, Cyril M., 3,613,739.

Nothern Car Wash Systems: *See—*
Oas, Obed M., 3,613,140.

N.V. Bataafsche Aanneming Maatschappij v/h: *See—*
Pronk, Cornelis Jan, 3,613,221.

N.V. COQ: *See—*
Boersma, Rintje, 3,614,355.

N.V. 'COQ'-Utrecht:*See—*
Boersma, Rintje; and Irik, Gijsbert W., 3,614,717.

NV Electromogorenfabriek Dordt Dordrecht: *See—*
Schiethart, Lodewijk, 3,614,496.
Nyquist, Frederick W.: *See—*
Blomstrand, John H.; and Nyquist, Frederick W.,3,614,296.
Nystrom, Walter: *See—*
Cook, Miles H.; Nystrom, Walter; Secrist, Duane R.; and Turk, Harold L.,3,613,228.
Oas, Obed M., to Nothern Car Wash Systems. Wheel and tire brush. 3,613,140, Cl. 15-21.
Oatfield, John C.: *See—*
Dent, Robin W.; Oatfield, John C.; and Mayes, Richard T.,3,613,445.
Oberthur, Heinrich, to Teves, Alfred, G.m.b.H. Switchover valve for pneumatic installations. 3,613,710, Cl. 137-102.
O'Brien, John Augustus:*See—*
Sanford, Lloyd Clifford; and O'Brien, John Augustus,3,614,241.
Ogasawara, Susumu: *See—*
Sato, Yoshikazu; and Ogasawara, Susumu,3,613,225.
Ogman, Murray. Dsposable cooking grease trap. 3,613,555, Cl. 99-446.
Ohgoshi, Akio; and Miyaoka, Senri, to Sony Corporation. Beam convergence device for color picture tube. 3,614,501, Cl. 313-70.
Ohio State University, The: *See—*
Kendall, Lytton A., Jr., 3,613,422.
Ohlson, B. Erik: *See—*
Descarries, Raymond; Gaudry, Paul E.; and Ohlson, B. Erik,3,614,705.
Ohlsson, Leonard W.; and Sitko, Robert H., to Whirlpool Corporation. Ice maker apparatus. 3,613,389, Cl. 62-137.
Ohrberg, Carl V., to Danfoss A/S. Radial piston pump. 3,614,265, Cl. 417-62.
Ohrberg, Carl V., to Danfoss A/S. Hydraulic rotary piston machine. 3,614,274, Cl. 418-61.
Oishi, Yoshihiro: *See—*
Awano, Taikichi; and Oishi, Yoshihiro,3,613,768.
Okonski, Jan. Toy boat with propulsion means and water cannon. 3,613,298, Cl. 46-95.
Okoshi, Hideo, to Nippon Seiko Kabushiki Kaisha. Constant-velocity universal joint. 3,613,397, Cl. 64-21.
Oldenburg, Kenneth F., 50% to Schwend, Fred N. Combined carrier and package. 3,613,881, Cl. 206-65.
Olin Corporation: *See—*
Ramsay, Marcus, 3,613,282.
Olivetti, Ing., C., & C., S.p.A.: *See—*
Bernardis, Francesco, 3,614,091.
Post, Gerald; Buchholtz, Charles M.; and Rattin, Luciano, 3,614,222.
O'Loughlin, James F.:*See—*
Delagi, Bruce A.; McFarland, Harold L., Jr.; and O'Loughlin, James F.,3,614,740.
McFarland, Harold L., Jr.; and O'Loughlin, James F.,3,614,741.
Olsen Magnetic Inc.: *See—*
Olsen, Willy; McKee, John B.; and Pahel, William M., 3,613,229.
Olsen, Willy; McKee, John B.; and Pahel, William M., said Olsen, and said Pahel, assor to Olsen Magnetic Inc. said Mckee, assor to Wagner Electric Corporation. Method of making transformer cores. 3,613,229, Cl. 29-605.
Olson, George E.: *See—*
Dissmeyer, Fred W.; and Olson, George E.,3,613,912.
Olympia Werke Aktiengesellschaft: *See—*
Thevis, Paul; Frobel, Artur; and Stoll, Oskar, 3,613,857.
Omron Tateisi Electronics Co.: *See—*
Ichimori, Masuo; and Suzaki, Hideyuki, 3,613,123.
Ono, Masahisa: *See—*
Nara, Akinao; and Ono, Masahisa,3,613,418.
Openshaw, Ian K., to Associated Electrical Industries Limited. Collimator for an X-ray analyzer. 3,614,424, Cl. 250-49.5
Opp, Theodore L. Merchandising and dispensing container. 3,613,958, Cl. 222-180.
Orbit International, Inc.: *See—*
Fernandez, Arthur; and Humphrey, David H., 3,613,329.
Orieux, Pierre P., to Compagnie Francais de Petroles Societe Anonyme. Tube connecting device. 3,613,727, Cl. 137-614.17
Ortel, William C. G.: *See—*
Biazzo, Martin R.; King, Bernard G.; and Ortel, William C. G.,3,614,201.
Osborn, Norman W. Hinge. 3,613,150, Cl. 16-134.
Osburn, Coy D.: *See—*
Rose, Dillard L.; and Osburn, Coy D.,3,614,252.
Ostrager, Seymour A. Self-ejecting key holder with illumination. 3,613,414, Cl. 70-414.
Ostrowski, Edwin A., to Controls Company of America. Mounting for flow control and outlet nipple on water valve. 3,613,735, Cl. 138-45.
Oswald, Joseph V. Shunt means for protecting a power supply against back EMF. 3,614,531, Cl. 317-16.
Otsuka, Katsumi, to Tiebow Company Limited. Writing instrument structure. 3,614,247, Cl. 401-199.
Otsuka, Katsumi. Pen wick made of synthetic resin. 3,614,248, Cl. 401-292.
Ott, Howard F., to Eastman Kodak Company. Liquid gate. 3,614,223, Cl. 355-30.
Ott, Owen J.: *See—*
Runyan, Raymond A.; and Ott, Owen J.,3,614,627.
Otto, Arnold: *See—*
Hermes, Heinz; Hinterthur, Helmut; Otto, Arnold; Thieme, Klaus Dietrich; and Westhoff, Heinz,3,614,723.
Otto, Friedrich, elder trust, Reg., mesne. Apparatus for finely comminuting meat or the like. 3,613,755, Cl. 146-192.
Otto, Robert J.: *See—*
Sinclair, Alex H.; and Otto, Robert J.,3,614,125.
Outboard Marine Corporation: *See—*
Prien, Walter F., Jr., 3,613,814.
Wick, Gerald H.; and Holtermann, Theodore J., 3,613,631.
Oval Kiki Kogyo Kabushiki Kaisha: *See—*
Ishikawa, Shigeji; Terayama, Yuji; and Wada, Masuhiro, 3,613,447.
Nishioka, Masakatu, 3,614,249.
Ovalstrapping, Inc.: *See—*
Pasic, James A., 3,614,150.
Oviatt, Edwin N. Blackboard eraser. 3,613,146, Cl. 15-231.
Owens-Illinois, Inc.: *See—*
Baker, Theodore C.; Bode, Wolfgang W.; Mathias, Richard G.; Nolan, James F.; and Pfaender, Lawrence V., 3,614,511.
Johnson, William E., 3,614,739.
Richey, Charles E., 3,613,222.
Oxford, David B.: *See—*
Jones, James J.; Oxford, David B.; and Zuch, Howard W.,3,614,634.
Oxlade, Roy R.: *See—*
Townsend, Nicholas A.; and Oxlade, Roy R.,3,613,428.
Oyama, Yoshitoshi; Takashima, Yoichi; and Aoki, Shigebumi, to Doryokuro Kakunenryo Kaihatsu Jigyodan. Gas centrifuges, their assembly and a process for enriching uranium 235. 3,613,989, Cl. 233-13.
Packard Instrument Company: *See—*
Dora, Ralph A., 3,613,729.
Padalino, Marco: *See—*
Mc Intosh, Robert P.; and Padalino, Marco,3,614,756.
Page, Wilbur Mills; and Coupland, Ralph, to Clayton Dewandre Company Limited. Apportioning valves for brake systems. 3,614,170, Cl. 303-7.
Pahel, William M.: *See—*
Olsen, Willy; McKee, John B.; and Pahel, William M.,3,613,229.
Paioletti, Jose. Padlocks. 3,613,409, Cl. 70-38.
Palanos, Paul N., to North American Rockwell Corporation. Black-body-pumped laser. 3,614,663, Cl. 331-94.5
Palmer, Charles L., to Tenneco Inc. Double triflow muffler. 3,613,829, Cl. 181-53.
Palmer, Selwyn, to Canadian Westinghouse Company, Limited. Inductive apparatus with magnetic locking plates. 3,614,695, Cl. 336-210.
Pamarco Incorporated: *See—*
Heurich, Charles, 3,613,578.
Panacon Corporation: *See—*
Morgan, Albert R., Jr.; Antoun, Paul R.; Callahan, Howard E.; and Maugel, Theodore R., 3,613,328.
Pankratz, Rudolf: *See—*
Pilz, Erwin; Vetter, Klaus; and Pankratz, Rudolf,3,613,933.
Paoletti, Charles: *See—*
Morane, Bruno; Paoletti, Charles; Merrien, Louis; Sathicq, Robert; and Maurelli, Manlio,3,613,961.
Paoli, Thomas L.; and Ripper, Jose E., to Bell Telephone Laboratories, Incorporated. Method for modulating semiconductor lasers. 3,614,447, Cl. 250-199.
Pape, Karl-Heinz, to Maschinenfabrik Hans Lange KG. Automatic adjusting device for clutches and brakes. 3,613,838, Cl. 188-163.
Pape, Karl Heinz, to Maschinenfabrik Hans Lenze K.G. Automatic adjusting device for clutches and brakes. 3,613,849, Cl. 192-84.
Papirno, Ralph P., to United States of America, Army. Zero deflection load transducer. 3,613,441, Cl. 73-141.
Paragon Gears, Incorporated: *See—*
Benson, Carl Ivar, Jr.; and Rapoza, James, 3,613,482.
Pararra, Julius, 1/2 to Deitch, William, d/b/a Deitch Sewing Machine and Supply Co. Thread controller device. 3,614,006, Cl. 242-20.
Parker, Louis W. Method of making stator assemblies for axial airgap machines. 3,613,227, Cl. 29-596.
Parker, William J.: *See—*
Marquis, Richard T., 3,613,273.
Parsons, Hubert J.; Catlin, Francis D.; and Cordier, James, to Hardinge Brothers Inc. Automatic positioning device for a lathe threading attachment. 3,613,488, Cl. 82-5.5
Pasic, James A., to Ovalstrapping, Inc. Lifting hook. 3,614,150, Cl. 294-78.
Pasquier, Claude-Marie; and Mannel-Sanson, Francoise. External control of variable frequency oscillator. 3,614,651, Cl. 331-65.
Paterson, James G. T., to Monsanto Company. Impact dyeing apparatus. 3,613,408, Cl. 68-204.
Patey, Walter George Wilfrid. Method and device for starting and stopping a dictating machine. 3,614,336, Cl. 179-100.1
Paton, Douglas W. Key fob. 3,613,416, Cl. 70-456.
Patterson, William C., to Atlantic Bridge Company Limited. Apparatus for conveying and handling articles. 3,614,167, Cl. 302-14.
Paulden, Robert Stewart, to Ferranti, Limited. A.C. voltage control apparatus. 3,614,595, Cl. 323-6.
Paule, Kurt; Schadlich, Fritz; and Hettich, Alfred, to Bosch, Robert, G.m.b.H. Electrical manicuring apparatus. 3,613,696, Cl. 132-73.6

Paules, Eugene H., to Yoe Leaf Tobacco Co. Method and apparatus for feeding cigar filler and the like. 3,613,953, Cl. 222-56.

Paulus, Rudolf, to Agfa-Gevaert Aktiengesellschaft. Film frame location device comprising means for detecting both leading and trailing edges of frame. 3,614,455, Cl. 250-219.

Pavlenko, Vladimir Alexandrovich: *See—*
Yalyshev, Aly Umyarocivh; Svecharnik, David Veniaminovich; Pavlenko, Vladimir Alexandrovich; Tsarkov, Vyacheslav Alexeevich; Bonch-Bruevich, Andrei Mikhailovich; and Levinson, Boris Alexandrovich,3,614,633.

Pavlica, Stanley R.: *See—*
Wallace, Richard W.; and Pavlica, Stanley R.,3,613,166.

Payne, Ivan Salisbury; and Goodacre, Cecil, to Lansing Bagnall Limited. Control of auxiliary movements on industrial trucks. 3,614,567, Cl. 318-305.

Payne, Jackie O. Ripper for disrupting hardpan and the like. 3,613,803, Cl. 172-699.

Pchelin, Vitaly Pavlovich: *See—*
Belopolsky, Anatoly Ovseevich; Evdokimov, Jury Pavlovich; Vexelman, Garald Lvovich; Nikolsky, Gennady Georgievich; and Pchelin, Vitaly Pavlovich,3,613,256.

Pearson, John; McLean, William B.; and Cosner, Lawrence N., to United States of America, Navy. Explosive device for perforating high strength metal plates. 3,613,581, Cl. 102-24.

Pearson, William E.: *See—*
Montanino, Louis N.; and Pearson, William E.,3,614,026.

Peck, Richard O., to Amsted Industries Incorporated. Riser construction for casting apparatus. 3,614,053, Cl. 249-105.

Peel, Richard V., to Marquardt Industrial Products Co. Railroad grade crossing protection system. 3,614,418, Cl. 246-128.

Peel, Robert. Yarn texturing and knitting apparatus. 3,613,403, Cl. 66-125.

Peery, Stephen H., Jr.: *See—*
Jaekle, William M.; Garin, Paul V.; Thomford, William E.; Greb, Wallace M.; Udaloff, Nicholas N.; and Peery, Stephen H., Jr.,3,613,914.

Peifer, Charles Robert, to Briggs & Stratton Corporation. Engine carburetor with throttle control lever. 3,613,648, Cl. 123-103.

Peil, William; and Pepe, Richard J., to General Electric Company. High speed memory and multiple level logic network with pulse shaping. 3,614,748, Cl. 340-173.

Pekker, Yakov Semenovich: *See—*
Ananiev, Lev Martemianovich; Pekker, Yakov Semenovich; Chakhlov, Vladimir Lukianovich; Sharachin, Yakov Afanasievich; Shtein, Mikhail Mikhailovich; and Yarushkin, Jury Pavlovich,3,614,638.

Pelletier, Raymond T.; and Becker, Karl V., to USM Corporation. Method and apparatus for making shoes. 3,613,138, Cl. 12-145.

Pennington, Keith S.: *See—*
Lean, Eric G.; Myers, Robert A.; and Pennington, Keith S.,3,614,462.

Pepe, Richard J.: *See—*
Peil, William; and Pepe, Richard J.,3,614,748.

Perfection Corporation: *See—*
Jacobson, Irvin D., 3,614,137.

Perkin-Elmer Corporation, The: *See—*
Preston, Kendall, Jr., 3,614,192.

Perkins, Earl Stuart; and Wierzbowski, Daniel A., to Butler National Corporation. X-Y plotter. 3,613,247, Cl. 33-1.

Perkins, Howard R., to Harris-Intertype Corporation. Stitcher assembly. 3,613,217, Cl. 29-432.2

Perkins, Merlyn H.: *See—*
Giedd, Gary R.; Maley, Gerald A.; and Perkins, Merlyn H.,3,614,608.

Perkinson, Robert E.: *See—*
Borrok, Martin J.; Perkinson, Robert E.; Watson, Fred D.; and Von Fange, Wilbur H.,3,614,728.

Perper, Lloyd J.: *See—*
McCurnin, Thomas W.; and Perper, Lloyd J.,3,613,259.

Perrenoud, Rene. Automatic machine for the manufacture of planar steel wire springs. 3,613,420, Cl. 72-131.

Perrin, Jack L., to Towlsaver, Inc. Strip material roll having improved trunnion and methods of shipping and dispenser mounting the same. 3,613,880, Cl. 206-65.

Perry, Kenneth Edward Gordon, to United Kingdom Atomic Energy Authority. Equipment for reading thermoluminescent dosimeters. 3,614,429, Cl. 250-71.

Persson, Tage: *See—*
Bank, Henning; Jilsen, Per-Owe; Klein, Hans; and Persson, Tage,3,614,498.

Pesis, Izrail Mordukhovich; and Shvarts, David Leonidovich. Voltage stabilizing device for electric drill motor. 3,614,568, Cl. 318-344.

Peters, Klaus-Jurgen: *See—*
Stumpp, Gerhard; and Peters, Klaus-Jurgen,3,613,650.

Petrolite Corporation: *See—*
Lissant, Kenneth J., 3,613,372.

Pettavel, Jacques: *See—*
Koulicovitch, Maurice; Pettavel, Jacques; and Wehrli, Pierre,3,614,454.

Pettibone Corporation: *See—*
Wojcik, Robert J., 3,614,351.

Pettit, Frank P., to Projects General of America. Rail expansion joint. 3,613,600, Cl. 104-91.

Petty, Eligia J. Chess playing aid. 3,613,261, Cl. 35-8.

Pfaender, Lawrence V.: *See—*
Baker, Theodore C.; Bode, Wolfgang W.; Mathias, Richard G.; Nolan, James F.; and Pfaender, Lawrence V.,3,614,511.

Phillips, John F., to Cessna Aircraft Company, The. Hydraulic cylinder with pressure control. 3,613,503, Cl. 91-26.

Phillips Petroleum Company: *See—*
Bridenstine, Orville J., 3,613,943.
DeShazo, Earl L., Jr., 3,614,650.
Larkin, Mark E., 3,613,895.
Seabourn, Ed O., 3,613,783.
Tarner, Jack, 3,613,380.

Phillips, Robert M. Solar energy concentrating device. 3,613,659, Cl. 126-270.

Phillips, Robert M., to Varian Associates. Electron tubes employing a hollow magnetron injected beam and magnetic field reversal focusing. 3,614,516, Cl. 315-3.5

Phocas, Dionysios M.: *See—*
Closmann, Philip J.; and Phocas, Dionysios M.,3,613,785.

Phonplex Corporation: *See—*
Slavin, Martin J., 3,614,738.

Photocircuits Corporation: *See—*
Burr, Robert P., 3,614,757.

Physics International Company: *See—*
Smiley, Parker C., 3,614,486.

Picker Corporation: *See—*
Green, Donald T., 3,614,432.
Snarr, James L.; and Hunt, Robert P., 3,613,547.

Pierce, Stanley L.; and Winn, William C., to Ford Motor Company. Ratio shift timing valves for use in a control system for a multiple ratio automatic power transmission mechanism. 3,613,484, Cl. 74-869.

Pike, Herbert J.: *See—*
Mazzone, Charles P.; and Pike, Herbert J.,3,613,186.

Pilz, Erwin; Vetter, Klaus; and Pankratz, Rudolf, to Stierlen-Werke Aktiengesellschaft. Warmth maintaining utensils. 3,613,933, Cl. 220-4.

Pinger, Edmund G.: *See—*
Landman, Dirk; and Pinger, Edmund G.,3,613,213.

Pinnow, Douglas A.; and Williamson, Samuel R., to Bell Telephone Laboratories, Incorporated. Acoustic light deflection cells. 3,614,204, Cl. 350-161

Pinsley, Edward A.; and Brown, Clyde O., to United Aircraft Corporation. Gas laser. 3,614,656, Cl. 331-94.5

Piper, Christopher Peter: *See—*
Mosebach, Wolfgang; and Piper, Christopher Peter,3,614,544.

Piquerez, Ervin. Process for manufacturing gold alloy watch casings. 3,613,209, Cl. 29-179.

Pitney Bowes-Alpex, Inc.: *See—*
Berler, Robert M., 3,614,430.

Pitney-Bowes, Inc.: *See—*
Beck, Christian A.; and Tomasch, Franz A., 3,614,095.

Plasser, Franz; and Theurer, Josef. Mobile apparatus for laying track ties. 3,613,598, Cl. 104-6.

Plastimetrix Corporation: *See—*
Laidman, Robert, 3,613,987.

Plate, Walter J., to Anaconda Wire and Cable Company. Pipe-type cable comprising aluminum conductors with high-elastic-modulus tensile strands. 3,614,290, Cl. 174-26.

Plath, Ernst-Dieter, to Mayer & Cie Maschinenfabrik. Yarn-changing device for circular knitting machines. 3,613,404, Cl. 66-140.

Platzek, Paul; Van Kempen, Gerardus Adrianus; and Ros, Dominicus, to Nederlandse Organisatie voor Toegepast-Natuurweten-Schappelijk Onderzoek Ten Behoeve Van Nijverheid Handel en Verkeer. Measuring width variations of a moving sheet by the use of beta-rays. 3,614,445, Cl. 250-83.6

Plessey Company Limited, The: *See—*
Mauger, Roy Harold; and Frampton, John Michael, 3,614,735.
Moss, Norman; and Broad, Michael John, 3,613,649.

Plihai, Hanns; Rothy, Gerhard; and Schild, Josef, to Vockenhuber, Karl, and Hauser, Raimund. Optical system. 3,613,544, Cl. 95-45.

Pneumatic Scale Corporation: *See—*
Trusselle, William H., 3,613,747.

Podgursky, Henry J. Fastener means including an interior expansible core. 3,613,495, Cl. 85-65.

Podvin, Albert; and Flynn, Mchael J., to International Business Machines Corporation. Apparatus and method in a multiple operand stream computing system for identifying the specification of multi-task situations and controlling the execution thereof. 3,614,745, Cl. 340-172.5

Poeschel, Robert L.: *See—*
United States of America,National Aeronautics and Space Administration, Administrator, 3,613,370.

Polaroid Corporation: *See—*
Bellows, Alfred H., 3,614,412.

Polgar, Emerick T., to Westinghouse Electric Corporation. Flotation apparatus. 3,613,614, Cl. 114-16.

Politzer, Eugene Jim. Electric shaving appliance. 3,614,382, Cl. 219-223.

Polygram Casting Company Limited: *See—*
Cowlam, Kenneth William, 3,613,769.

Pomagalski, Jean. Support device for aerial cable. 3,613,601, Cl. 104-197.

Pool, Stuart D.; Meitl, Harold G.; Rickerd, Calvin P.; Middlesworth, Tommy A.; Findlay, Jack B.; Thayer, Arlie J.; and Svereika, Edward,

deceased0 (by Svereika, Mary J.; legal representative), to International Harvester Company. Fruit catcher and conveyor system. 3,613,342, Cl. 56-329.

Poon, Yuen Sang, to Yuen Sang Hardware Co., Ltd. End attachments for watch bracelets. 3,613,183, Cl. 24-265.

Poor, John H.; and Logan, Charles H. Inflatable massaging pad for a seat. 3,613,671, Cl. 128-24.

Popeck, Charles A.: *See—*
Beard, Lloyd R.; Mc Naghten, Delmar E.; and Popeck, Charles A.,3,614,700.

Popeil Brothers, Inc.: *See—*
Popeil, Samuel J., 3,613,553.
Popeil, Samuel J., 3,614,381.

Popeil, Samuel J., to Popeil Brothers, Inc. Apparatus for puffed potato product. 3,613,553, Cl. 99-426.

Popeil, Samuel J., to Popeil Brothers, Inc. Hair setting device. 3,614,381, Cl. 219-222.

Porrelli, Leonard B. Cutter for floor covering such as linoleum and the like. 3,613,239, Cl. 30-293.

Porsche, Dr.- Ing. h.c.F., K.G., Firma: *See—*
Porsche, Ferdinand Anton Ernst; and Breyer, Paul, 3,613,644.

Porsche, Ferdinand Anton Ernst; and Breyer, Paul, to Porsche, Dr.-Ing. H.c.F., K.G., Firma. Fuel injection device. 3,613,644, Cl. 123-32.

Port, Donald H.: *See—*
Gourdine, Meredith C.; Collier, Edward L.; Lewis, Gerald P.; Mc Crae, Harold; and Port, Donald H.,3,613,993.

Porter, David Lee, to Western Electric Company, Incorporated. Multiple-contact glass sealed dry reed switching device. 3,614,683, Cl. 335-152.

Portlock, John M.: *See—*
Brown, William L.; and Portlock, John M.,3,614,724.

Portman, Warren C., to Columbia Broadcasting System, Inc. Methods and apparatus for producing film disc segments. 3,614,224, Cl. 355-53.

Portyrata, Raymond E.: *See—*
Gilmont, Roger; and Portyrata, Raymond E.,3,613,952.

Posh, Raymond C.; and Downs, William T., to Lear Siegler, Inc. Aspirated exhaust system. 3,613,359, Cl. 60-30.

Post, Gerald; Buchholtz, Charles M.; and Rattin, Luciano, to Olivetti, Ing., C., & C., S.p.A. Optical drive system for reproducing machine. 3,614,222, Cl. 355-8.

Potlatch Forests, Inc.: *See—*
Keller, Harold; and Young, Patrick J., 3,613,859.

Potomac Iron Works, Inc.: *See—*
Mulitz, Lewis, 3,613,908.

Potteiger, Lester A.: *See—*
Talley, James C.; and Potteiger, Lester A.,3,613,586.

Power Control, Inc.: *See—*
Cottrell, Harold L., 3,613,366.

Precise Forms, Inc.: *See—*
Trimmer, James E., 3,614,051.

Pres-on Products, Inc.: *See—*
Gianatasio, Henry L., 3,613,318.

Presti, Biagio S., to Sarkes Tarzian, Inc. Apparatus for recording and reproducing single frame video images on a plural track record. 3,614,309, Cl. 178-6.6

Preston, Kendall, Jr., to Perkin-Elmer Corporation, The. Holographic logic operator for an optical date processing system. 3,614,192, Cl. 350-3.5

Price, H. C., Co.: *See—*
Eisele, Charles W., 3,614,605.

Prien, Walter F., Jr., to Outboard Marine Corporation. Variable speed drive for lawn mower. 3,613,814, Cl. 108-19.

Prince Instruments, Inc.: *See—*
Edenhofer, Harry J., 3,613,670.

Printing Plate Supply Co.: *See—*
Redding, Edward M., 3,613,174.

Probert, Walter L.; and Finch, Steven R., to Wisconsin Electrical Mfg., Co., Inc. Batch-controlled readout system. 3,614,397, Cl. 235-92.

Projects General of America: *See—*
Pettit, Frank P., 3,613,600.

Pronk, Cornelis Jan, to N.V. Bataafsche Aanneming Maatschappij v/h. Method for connecting an anchoring device to the rear of a frontal plate or the like. 3,613,221, Cl. 29-526.

Prosser, David G., to Autorol Corporation. Diaphragm actuator. 3,613,518, Cl. 92-98.

Pugh, Paul F. Method for manufacturing high voltage cable systems. 3,613,231, Cl. 29-624.

Pullen, John, to Burndy Corporation. Transmission line cable damper. 3,614,291, Cl. 174-42.

Purcell, Thomas H., Jr. Aircraft. 3,614,032, Cl. 244-36.

Purolator Products, Inc.: *See—*
Torres, Jorge, 3,613,726.

Pyles Industries, Inc.: *See—*
Wood, Fred M., 3,613,465.

Quinn, Frederic R., to Zyrotron Industries, Inc. Thermal sensing device. 3,614,345, Cl. 200-2.

Quinn, John S.; and Murch, Walter G., to United States of America, Air Force. Backlobe jamming burnthrough range calculator. 3,613,991, Cl. 235-85.

Quint Machine Corporation: *See—*
Fitzpatrick, Richard; Fitzpatrick, Richard D.; and Balch, William, 3,613,251.

Rabinow, Jacob: *See—*
Apstein, Maurice; Blomgren, Evert; Keehn, George R.; Andrews, Laurence M.; and Rabinow, Jacob,3,613,589.

Radcliffe, Arthur J., Jr., to Burroughs Corporation. Information storage device. 3,614,749, Cl. 340-173.

Rafanelli, Renzo. Apparatus for the purification of waste gases. 3,613,334, Cl. 55-222.

Raidel, John E., to Ridewell Corporation. Trailing axle suspension. 3,614,123, Cl. 280-104.5

Rain Bird Sprinkler Mfg., Corporation: *See—*
Kane, Neil G., 3,613,995.

Ramey, Robert M., to Teledyne Inc. Detachable burner assembly. 3,614,281, Cl. 431-180.

Ramsay, Marcus, to Olin Corporation. Electrical ignition shotgun for firing caseless ammunition. 3,613,282, Cl. 42-84.

Ramseier, Paul, to Bracker AG. Safety device for machine tools. 3,613,981, Cl. 227-1.

Ramsey, Thomas H.: *See—*
Shield, Richard; and Ramsey, Thomas H.,3,614,554.

Ramult, Jerry P. Magnetic tape cartridge. 3,614,009, Cl. 242-55.19

Rand, Sydney. Continuously variable transmission system employing segmented pulleys. 3,613,468, Cl. 74-217.

Ranft, Ernst L.: *See—*
Zeigler, Philip B.; St. Amand, James C.; and Ranft, Ernst L.,3,613,944.

Range, Richard J., to Bowles Fluidics Corporation. Bernoulli, conveyor. 3,614,168, Cl. 302-31.

Rankin, Armand T. Spring clips for tubular furniture. 3,613,184, Cl. 24-265.

Raphael, Martin, to Dytro Corporation. Print wheel positioning system. 3,614,576, Cl. 318-625.

Rapid Metal Development Limited: *See—*
Young, George B. A., 3,614,048.

Rapoza, James: *See—*
Benson, Carl Ivar, Jr.; and Rapoza, James,3,613,482.

Rasmussen, Holger O., to CWS Apparate AG. Apparatus for temporarily locking a spindle, particularly in a hand towel dispenser. 3,613,478, Cl. 74-565.

Rattin, Luciano: *See—*
Post, Gerald; Buchholtz, Charles M.; and Rattin, Luciano,3,614,222.

Ravella, Arthur, to Boris Kroll Jacquard Looms, Inc. Shuttleless loom. 3,613,741, Cl. 139-127.

Raviv, Josef: *See—*
McLaughlin, John A.; and Raviv, Josef,3,614,736.

Raycon Corporation: *See—*
Simpkins, Robert L.; Karr, Joseph R.; and Lagg, Jerry W., 3,614,371.

Raytheon Company: *See—*
Monchamp, Roch R.; Weber, Marvin J.; and Bass, Michael, 3,614,662.

RCA Corporation: *See—*
Avins, Jack, 3,614,546.
Caplan, Sandor, 3,614,210.
Carrell, Ross M., 3,614,767.
Farnett, Edward Charles; and Upton, Lee Oliver, Jr., 3,614,400.
Franklin, David Louis; and Fehder, Barry Joel, 3,614,553.
Fulton, Langdon Hollister, 3,614,579.
Guerrero, Michael Carl; Jutice, Robert Earl; and Rudy, Richard Miller, 3,613,976.
Hall, William B.; and Block, Fred G., 3,613,773.
Kratzer, Dale L., 3,614,785.
Silverstein, Bernard, 3,614,714.
Stewart, Wilber Clarence; and Cosentino, Louis Salvatore, 3,614,189.
Taylor, George William, 3,614,200.
Volkmann, John E., 3,614,320.
Wheatley, Carl Franklin, Jr., 3,614,645.

R. D. T. Societe pour l'Etude, la Realisation et al Diffusion des Techniques Modernes:*See—*
Chartier, Andre Maurice, 3,614,005.

Reaction Instruments, Incorporated: *See—*
Gerig, John S., 3,614,649.

Reagan, Michael H., to United States of America, Air Force. Restraining device for air drop loads. 3,614,043, Cl. 248-119.

Reclosable Package Corporation: *See—*
Miller, Harmon B., 3,613,874.

Redding, Edward M., to Printing Plate Supply Co. Apparatus for producing molded printing plates. 3,613,174, Cl. 18-19.

Redfern, John T., to United States of America, Navy. Cycloconverter using bidirectional semiconductor switches. 3,614,592, Cl. 321-69.

Redmond, William G.: *See—*
Johnson, Richard M.; and Redmond, William G.,3,613,276.

Reed, David W., to International Business Machines Corporation. Anti-wear shield for continuously rotatable type disc printer. 3,613,856, Cl. 197-54.

Reed, Sherwood, to United States of America, Army. Floating settler for separation of liquid and solid phases. 3,613,889, Cl. 210-84.

Reese, Garald D.: *See—*
Brandli, Ronald I.; Klema, Lawrence E.; and Reese, Garald D.,3,613,811.

Reese, Gerald D.: *See—*
Hetteen, Donnelly L.; and Reese, Gerald D.,3,613,810.

Reeves, Sam B. Nut harvester. 3,613,341, Cl. 56-328.

Regan, John. Tool joint stripping stationary blowout preventer with a retrievable packing insert. 3,614,111, Cl. 277-3.

Regie Nationale des Usines Renault: *See—*
Drevard, Michel; Mognetti, Charles; and Vermot, Andre, 3,613,396.
Froumajou, Armand, 3,613,645.

Rehm, William A.; Griffin, Phil H., III; and Sharki, Martin J., to Dresser Industries, Inc. Method and apparatus for monitoring potential or lost circulation in an earth borehole. 3,614,761, Cl. 340-239.

Rehse, Denis O.; Brooks, Alfred P.; and Bilello, Michael J., said Rehse and Brooks assors. to said Pfizer, Inc. Bottle label detector-label inspecting and sorting apparatus. 3,613,885, Cl. 209-111.7

Reibel, Robert H.: *See—*
Martinez, Eugene, 3,614,040.

Reich, Paul A.: *See—*
Grow, Harry N.; Huempfner, David F.; and Reich, Paul A.,3,613,606.

Reiff, Donald H., to Stearns Electric Corporation. Fluid actuated and lubricated clutch with splined release springs. 3,613,848, Cl. 192-70.28

Reimers, James L., to FMC Corporation. Heat treatment apparatus. 3,613,551, Cl. 99-360.

Reimers, James L., to FMC Corporation. Conveying system. 3,613,865, Cl. 198-131.

Reimpell, Uwe: *See—*
Scheidig, Helmut; Hauff, Alfred; and Reimpell, Uwe,3,614,284.

Reinbold, Otto Horst, to Blessing-Werke KG. Time measuring and date indicating device. 3,613,349, Cl. 58-4.

Reinert, Owen E., to Emerson Electric Co. DC motor controllers with IR compensation for extended speed range. 3,614,569, Cl. 318-345.

Reinhart, Theodore J., Jr. Fabric inserts for filament wound aircraft tires. 3,613,762, Cl. 152-354.

Reinshagen, Kurt, to Elektrodenfabrik Oerlikon Buhrle AG. Method and apparatus for detecting workpiece surface defects and for fixing the location thereof using magnetic particles. 3,614,604, Cl. 324-38.

Reisman, Howard, to Bakery Specialty Machinery Co. Detachable bearing for extruder. 3,613,603, Cl. 107-14.

Reliable Pattern Works, Inc.: *See—*
Koehnle, Ronald L., 3,613,760.

Remco Industries, Inc.: *See—*
Tomaro, Patrick M., 3,613,297.

Rennick, John L.: *See—*
Figlewicz, Raymond C.; and Rennick, John L.,3,614,519.

Renold, Walter. Apparatus for intermittently moving film. 3,613,978, Cl. 226-117.

Repper, Theodore A. Method and apparatus for eliminating iron oxide dust. 3,613,421, Cl. 72-38.

Resch, Richard J.: *See—*
Hendrickson, Philip J.; and Resch, Richard J.,3,614,157.

Research Corporation: *See—*
McFarland, Gordon B., Jr., 3,613,120.

Restall, George; and Hattersley, Robert M. Device for supplying animals with water or other liquid. 3,613,642, Cl. 119-75.

Revco, Inc.: *See—*
Vermes, Roy E., 3,613,528.

Rex Chainbelt Inc.: *See—*
Bradbury, Bernard, 3,613,916.

Reynolds, Frank L.: *See—*
Crump, Ralph E.; Reynolds, Frank L.; and Tillstrom, Carl R.,3,613,689.

Reynolds Metals Company: *See—*
Brunner, Hans A., 3,614,613.

Reynolds, Verne J. Surface conforming disposable surgical preparation applicator and tray therefor. 3,613,685, Cl. 128-269.

Rheinstahl Siegener Eisenbahnbedarf GmbH: *See—*
Schneider, Felix; Wagener, Paul-Werner; Neuser, Ernst; and Walser, Rudolf, 3,613,311.

Rhyne, William A.; Mc Crory, William W., Jr.; and Mallory, Ray R., to United States of America, Navy. Buoyant cable towing system. 3,613,629, Cl. 114-235.

Ribour, Jean Louis; and Denise, Francois Emile Clement, to International Standard electric Corporation. Tuning a variable oscillator. 3,614,666, Cl. 331-177.

Riccius, Rolf; and Weitkamp, Gunter, to Vereinigte Flugtechnische Werke Gesellschaft mit beschrankter Haftung fruher 'Weser' Flugzeugbau/ Focke-Wulf/Heinkel-Flugzeugbau. Apparatus for loading on an airplane goods to be dropped off or tilted out of the plane. 3,613,498, Cl. 89-1.5

Richardson, Donald M. Camera traversing structure. 3,613,546, Cl. 95-86.

Richey, Charles E., to Owens-Illinois, Inc. Method for making a lightweight optical mirror. 3,613,222, Cl. 29-527.1

Richman, Walter A.: *See—*
Huber, George H.; Gertler, Eugene I.; Habgood, Dennis W.; Ciarrocchi, John A.; and Richman, Walter A.,3,614,765.

Richmond, Irving D., to United Aircraft Corporation. Range-gated moving target indicator. 3,614,784, Cl. 343-7.7

Richter, Albert P., Jr.; and Bruner, James D., to Texaco, Inc. Slip ring assembly. 3,614,726, Cl. 340-18.

Rickerd, Calvin P.; and Middlesworth, Tommy A., to International Harvester Company. Conveyor wheel. 3,613,868, Cl. 198-211.

Rickerd, Calvin P.: *See—*
Pool, Stuart D.; Meitl, Harold G.; Rickerd, Calvin P.; Middlesworth, Tommy A.; Findlay, Jack B.; Thayer, Arlie J.; and Svereika, Edward,3,613,342.

Ridewell Corporation: *See—*
Raidel, John E., 3,614,123.

Riegel Paper Corporation: *See—*
Lense, Robert F.; and Court, Wilbur M., 3,613,525.

Rieke Corporation: *See—*
Summers, Kenneth L., 3,613,966.

Rieman, Willis E.; and Betz, Edward R., to Gulf & Western Systems Company. Intermittent control for windshield wiper systems. 3,614,573, Cl. 318-443.

Rieth, James E. Apparatus for control depth fishing. 3,614,016, Cl. 242-106.

Rifkin, Frank, to Turbo-Compressor Engine Corporation. Turbo-compressor engine. 3,613,361, Cl. 60-39.41

Rigaku Denki Co., Ltd.: *See—*
Yoshimatsu, Mitsuru, 3,614,425.

Riggs & Lombard Inc.: *See—*
Holm, William J., 3,613,187.

Riggs, Ernest, to New Mexico Chili Company. Harvesters for peppers and other crops. 3,613,339, Cl. 56-130.

Rigrod, William W., to Bell Telephone Laboratories, Incorporated. Synchronous coupling of laser oscillators to a common resonator. 3,614,659, Cl. 331-94.5

Rihal, Gursharan Singh: *See—*
Mohan, Chandra; Rihal, Gursharan Singh; and Devgun, Balbir Singh,3,613,798.

Riley, Eugene D.: *See—*
Sagouspe, Jean; and Riley, Eugene D.,3,613,343.

Ringland, Robert S., to Antennacraft Company. UHF-VHF antenna preamplifier. 3,614,628, Cl. 325-365.

Riordan, Hugh E., to Kelsey-Hayes Company. Skid control system. 3,614,172, Cl. 303-21.

Ripper, Jose E.: *See—*
Paoli, Thomas L.; and Ripper, Jose E.,3,614,447.

Ritchey, Harold W., to Thiokol Chemical Corporation. Thrust-termination nozzle for a solid-propellant rocket engine. 3,613,374, Cl. 60-219.

Ritchie, Frederick Stafford: *See—*
Seeley, John Scott; Smith, Stanley Desmond; and Ritchie, Frederick Stafford,3,614,188.

Robbins, James S., and Associates, Inc.: *See—*
Fikse, Tyman H., 3,613,383.

Roberts, Walter L.; and Newton, Henry Lynn, to Superior Continental Corporation. Filter to secure privacy of carrier-derived telephone circuits. 3,614,323, Cl. 179-1.5

Roberts, William L., to United States Steel Corporation. Annealing strip during cold rolling. 3,613,425, Cl. 72-202.

Robertshaw Controls Company: *See—*
Willson, James R.; Krueger, Keith T.; Tyler, Hugh J.; and Jackson, Wilbur F., 3,613,732.

Robertson, H. H., Company: *See—*
Motts, Paul V.; and Stoops, Wayne K., 3,613,548.

Robinson, Aubrey C. Electric heating oven system. 3,614,388, Cl. 219-400.

Rocform Corporation: *See—*
Babbage, William C., 3,614,052.

Rock-Ola Manufacturing Corporation: *See—*
Rockola, Donald C.; and Bookout, Floyd V., 3,613,945.

Rockola, Donald C.; and Bookout, Floyd V., to Rock-Ola Manufacturing Corporation. Can vending and feed mechanism. 3,613,945, Cl. 221-295.

Rockwell Manufacturing Company: *See—*
Kelly, Hubert K.; McDonnell, Thomas J.; and Lamkin, Richard C., 3,613,485.

Roese, Robert, to Bissett-Berman Corporation, The. Electrolytic cell having improved construction. 3,614,545, Cl. 27-230.

Rogers, Jae P. Adjustable keyboard transposing adapter and instrument. 3,613,494, Cl. 84-448.

Rogge, Bernhard, to United States of America, Army. Closure and method of making the same. 3,613,935, Cl. 220-24.

Rohr Corporation: *See—*
Millman, Victor, 3,614,024.
Tanner, Carole S., 3,613,996.

Rohrer, Karl R. Building construction. 3,613,321, Cl. 52-73.

Roll, Karl: *See—*
Beck, Charlotte; Roll, Karl; and Kummer, Fritz,3,613,668.

Rolls-Royce Limited: *See—*
Campbell, David Alexander, 3,614,257.
Ellinger, John H., 3,614,260.
Jubb, Albert; Hutchinson, Stanley; and Webb, Richard 3,613,363.

Romberger, Frank: *See—*
Hill, Charles C.; and Romberger, Frank,3,613,242.

Romero, Ervin G., to Boeing Company, The. Anti-skid control system. 3,614,174, Cl. 303-21.

Roneo Limited: *See—*
Woodhead, James; Hedley, David Alan; and Jardine, Maurice Revie, 3,613,573.

Ronka, Vaino, to Geonics Limited. Electromagnetic prospecting apparatus for detecting electrically or magnetically responsive ore bodies. 3,614,600, Cl. 324-4.

Rooney, James J. H., to General Electric Company. Thrust balancing arrangement for steam turbine. 3,614,255, Cl. 415-100.

Rorden, Louis H., to Develco, Inc. Radio frequency standard and voltage controlled oscillator. 3,614,630, Cl. 325-421.

Ros, Dominicus: *See—*
Platzek, Paul; Van Kempen, Gerardus Adrianus; and Ros, Dominicus,3,614,445.

Rosa, John, to Westinghouse Electric Corporation. Force commutation circuits. 3,614,594, Cl. 321-45.

Rose, Dillard L.; and Osburn, Coy D., to Williamson, T. D., Inc. Tapping apparatus. 3,614,252, Cl. 408-9.

Rose, Robert Joseph; and Sanders, Frank Wilson, to Multimatic Displays, Inc. Apparatus for the sequential and selective projection of groups of strips or the like and casettes for the installation of the strips in a housing. 3,613,277, Cl. 40-65.

Rosemount Engineering Company: *See—*
Lode, Tenny D., 3,614,401.

Rosenblatt, Jerome J.: *See—*
Beelik, Victor, Jr.; and Rosenblatt, Jerome J.,3,614,439.

Rosenthal, Sol Roy. Vision-aiding device. 3,614,216, Cl. 351-44.

Ross, Albert L. Bag making machine. 3,613,288, Cl. 93-35.

Ross, Howard R.: *See—*
Mackie, Harry A.; and Ross, Howard R.,3,613,822.

Rossire, Francis Henry Sand, to Bendix Corporation, The. Optical display means for an all-weather landing system of an aircraft. 3,614,314, Cl. 178-7.88

Roszelle, Wayne O.: *See—*
Jones, Stanley C.; Roszelle, Wayne O.; and Svaldi, Marvin A.,3,613,786.

Roth, Robert Richard, to Deere & Company. Implement carrier. 3,613,801, Cl. 172-456.

Roth, Roy E., Company: *See—*
Sieghartner, Leonard J., 3,614,256.

Rothauser, Charles; and Thompson, Bruce R., to Caroma Sales Proprietary Limited. Taps. 3,614,059, Cl. 251-267.

Rothy, Gerhard: *See—*
Plihal, Hanns; Rothy, Gerhard; and Schild, Josef,3,613,544.

Roudaut, Edouard: *See—*
Allemand, Robert; Jacobe, Jean; and Roudaut, Edouard,3,614,437.

Rowan Controller, Inc.: *See—*
Haydu, John L.; and Coleman, Bernard, 3,614,680.

Rowland, Le Roy R.; and Tavelle, Charles L. Apparatus for manufacture of cored rubber rolls having a sleeve thereon. 3,613,168, Cl. 18-30.

Royal Seating Corporation: *See—*
Jennings, Roy E., 3,614,186.

Royet, Jean, to Compagnie Generale d'Electricite. Superconducting conductor. 3,614,301, Cl. 174-126.

Rozelle, Donald S.; Rozelle, Ralph B.; and Nejib, Umid R., to Magnetech Industries, Inc. Variable induction sevice. 3,614,692, Cl. 336-15.

Rozelle, Ralph B.: *See—*
Rozelle, Donald S.; Rozelle, Ralph B.; and Nejib, Umid R.,3,614,692.

Rozentals, Alfreds R., to Heim Universal Corporation. Spherical bearing assembly. 3,614,182, Cl. 308-72.

Rozmus, Walter J., to Kelsey-Hayes Company. Adjustable gate for butt welding machine. 3,613,984, Cl. 228-3.

Ruben, Murray, to Digital Equipment Corporation. Variable stroke character generator. 3,614,743, Cl. 340-172.5

Rucker Company, The: *See—*
Douglas, Ellwood S.; and Wahlgren, Wallace W., 3,614,533.

Rudelius, Per; and Sallow, Ake, to Allmonna Svenska Elektriska Aktiebolaget. Means for keeping the position of a ship constant during mooring. 3,613,625, Cl. 114-230.

Rudy, Richard Miller: *See—*
Guerrero, Michael Carl; Jutice, Robert Earl; and Rudy, Richard Miller,3,613,976.

Rufenacht, Jack: *See—*
Steinemann, Adolf; and Rufenacht, Jack,3,614,236.

Rumpelein, Fritz: *See—*
Kisselmann, Willy; Rumpelein, Fritz; Landbrecht, Franz; and Knopf, Paul,3,614,612.

Rundle, David F.: *See—*
Anderson, Norman R.; and Rundle, David F.,3,614,711.

Runyan, Raymond A.; and Ott, Owen J., to Data-Control Systems, Inc. Universal demodulation system. 3,614,627, Cl. 325-345.

Rush, Christopher: *See—*
Van Auken, John A.; Rush, Christopher; Blank, Fritz A.; Hoffman, Lionel; and Barto, Robert,3,614,089.

Russell, Edward J.; Brown, Gaylord W.; and Dorman, Dennis J., to Brown Machine Company of Michigan, Inc. Container printing machine and method of printing. 3,613,571, Cl. 101-40.

Ruthenberg, Ross E.; and Evitts, James C., Jr., to Motorola, Inc. Solid state ramp generator for developing a modulated ramp signal in a tandem serrasoid modulator. 3,614,470, Cl. 307-228.

Ryan, Francis D.: *See—*
Herzog, Josef; and Ryan, Francis D.,3,614,112.

Ryden, James W.; and Abromavage, John C., to Arcoa, Incorporated. Tow dolly for wheeled vehicles. 3,613,921, Cl. 214-85.

Rynberk, Robert W. Water level indicating and control construction. 3,613,310, Cl. 47-48.5

SAAB Aktiebolag: *See—*
Aslund, Nils Robert Dahr, 3,614,233.

Sadowsky, Charles. Dactylog, Inc. Method and apparatus for individual recognition. 3,614,737, Cl. 340-146.3

Sagouspe, Jean; and Riley, Eugene D., to Genie Grape Harvester, Inc. Grape harvester. 3,613,343, Cl. 56-330.

Sakaguchi, Mituhito; and Nishida, Nobuo, to Nippon Electric Company, Limited. Associative memory employing holography. 3,614,191, Cl. 350-3.5

Sakamoto, Toemon, to Enshu Limited. Method and apparatus for producing fabrics of quality with considerably enhanced productivity. 3,613,743, Cl. 139-348.

Salerno, James: *See—*
Sommer, Helmut; and Salerno, James,3,614,779.

Salloum, Charles R. Vehicle-parking system. 3,613,909, Cl. 214-16.1

Sallow, Ake: *See—*
Rudelius, Per; and Sallow, Ake,3,613,625.

Salomon, Georges Pierre Joseph. Rear holding device for ski boots. 3,614,118, Cl. 280-11.35

Sanami, Masashi: *See—*
Hasegawa, Hisao; and Sanami, Masashi,3,613,398.

Sanders Associates, Inc.: *See—*
Bliss, Frank E., Jr., 3,613,774.

Sanders, Frank Wilson: *See—*
Rose, Robert Joseph; and Sanders, Frank Wilson,3,613,277.

Sanders, Norman Thomas. Method of and apparatus for use in producing a three dimensional model of a piece of terrain. 3,613,501, Cl. 90-13.

Sanderson Films, Inc.: *See—*
Sanderson, Paul E., 3,614,393.

Sanderson, Paul E., to Sanderson Films, Inc. Navigational computer. 3,614,393, Cl. 235-61.

Sanford, Clarence H. Buoyant lantern support. 3,614,417, Cl. 240-52.

Sanford, Lloyd Clifford; and O'Brien, John Augustus, to Itek Corporation. Automatic recording dinsitometer which simultaneously determines and records the optical density of a strip of photographic film. 3,614,241, Cl. 356-175.

Sankyo Kogaku Kogyo Kabushiki Kaisha: *See—*
Hirabayashi, Yoshiaki, 3,613,535.

Sansone, Fred A. Removable toilet seat. 3,613,130, Cl. 4-240.

Sarbach, Ronald A., to Westinghouse Air Brake Company. Fluidic speedometer. 3,613,459, Cl. 73-506.

Sarkes Tarzian, Inc.: *See—*
Presti, Biagio S., 3,614,309.

Sarmiento, Louis, to International Stretch Products, Inc. One-piece or two-piece panty-type garment, and process and fabric suitable for making such garment. 3,613,119, Cl. 2-224.

Sarno, Richard L., 'Automatic' Sprinkler Corporation of America. Retractable overhead basketball backboard support structure. 3,614,099, Cl. 273-1.5

Sarvas, Maynard C. Furniture unit. 3,614,156, Cl. 297-224.

Sasabe, Kaoru; and Kotera, Hiroaki, to Matsushita Electric Industrial Co., Ltd. Discharge lamp modulation system. 3,614,307, Cl. 178-6.

Sathicq, Robert: *See—*
Morane, Bruno; Paoletti, Charles; Merrien, Louis; Sathicq, Robert; and Maurelli, Manlio,3,613,961.

Sato, Fujio: *See—*
Iwai, Katsuyuki; Fukatsu, Motonori; and Sato, Fujio,3,614,308.

Sato, Jiro: *See—*
Komori, Shigehiro; Sato, Jiro; and Kurahashi, Akira,3,614,220.

Sato, Yoshikazu; and Ogasawara, Susumu. Tool changer for machine tool. 3,613,225, Cl. 29-568.

Satzler, Ronald L.: *See—*
Hollenberg, Dale W.; Loyd, Calvin D.; and Satzler, Ronald L.,3,613,982.

Sauber, Charles R., to Aerotron, Inc. System for remotely controlling and monitoring fuel dispensing pumps. 3,613,950, Cl. 222-16.

Saunier Duval: *See—*
Carlier, Claude; and Gravez, Andre, 3,613,927.

Sawyer, Harold T., 17 1/% to Beehler, Vernon D. Material conditioning device. 3,613,141, Cl. 15-98.

Scapa Dryers (Canada) Ltd.: *See—*
Haythornthwaite, James; and Fardeau, Joseph A., 3,613,176.

Scarpino, Frank A., to National Cash Register Company, The. Device for translating binary data to a jitter- controlled asynchronous frequency modulated signal. 3,614,624, Cl. 325-163.

Schadlich, Fritz: *See—*
Paule, Kurt; Schadlich, Fritz; and Hettich, Alfred,3,613,696.

Schaper, Donald W.: *See—*
Forster, Klaus W.; and Schaper, Donald W.,3,613,602.

Scheffler, Paul H.; and McCabria, Jack L., to Westinghouse Electric Corporation. Scavenger plate for pump inlet. 3,614,258, Cl. 415-208.

Scheidig, Helmut; Hauff, Alfred; and Reimpell, Uwe, to Leybold-Heraeus-Verwaltung GmbH. Melting furnace with movable current carrying leads for a consumable electrode. 3,614,284, Cl. 13-13.

Scheler, Holger: *See—*
Werkmeister, Johannes; and Scheler, Holger,3,613,487.

Schenk, Horst; Wetter, Jakob; and Guse, Rudolf, to MaschinenfabrikSack G.m.b.H. Forging machine. 3,613,432, Cl. 72-399.

Schenke, Reynold E. Lifetime candle including fuel supply indicating means therefor. 3,614,279, Cl. 431-17.

Schickling, Robert A. Automatic mail opener. 3,613,315, Cl. 51-74.

Schiess Aktiengesellschaft: *See—*
Wagner, Hans O., 3,613,502.

Schiethart, Lodewijk, to NV Electromogorenfabriek Dordt Dordrecht. Synchronous electric motor. 3,614,496, Cl. 310-162.
Schiff, Peter. Mechanical ventricular assistance cup. 3,613,672, Cl. 128-24.5
Schiff, Peter. Highly selective filter circuit. 3,614,478, Cl. 307-295.
Schifferle, Peter, to Holzwerte AG. Collapsible crate or box. 3,613,931, Cl. 217-12.
Schild, Josef: *See—*
Plihal, Hanns; Rothy, Gerhard; and Schild, Josef,3,613,544.
Schilling, Robert G.: *See—*
Schilling, Robert G., Jr., 3,613,292.
Schilling, Robert G., Jr., to Schilling, Robert G., and Connor, Andy. Nesting half-logs for toy structures. 3,613,292, Cl. 46-20.
Schjeldahl, G. T., Company: *See—*
Anderson, Donald E., 3,613,633.
Schlapp, Werner, to Leitz, Ernest, G.m.b.H. Combined lens hood and filter support. 3,614,196, Cl. 350-58.
Schlecht, Francis, to Constructeurs Associes pour le Montage d'Ouvraces Metalliques, Constructions Metalliques de Provence and Compagnie Industrielle Maritime. Floating-roof hydrocarbon tank. 3,613,937, Cl. 220-26.
Schleicher, Thomas R.; and Auten, Robert D. Apparatus facilitating the counting and disposal of surgical sponges. 3,613,899, Cl. 211-133.
Schlitz, Jos. Brewing Company: *See—*
Bayne, Peter D., 3,613,954.
Schlumberger Technology Corporation: *See—*
Moran, James H., 3,614,725.
Schluntz, Gary L.: *See—*
Daughton, John W.; Donohue, James M.; and Schluntz, Gary L.,3,614,419.
Schmidt, John A.; and Kerst, Donald W., to United States of America, Atomic Energy Commission. Capacitive-coupled probe for measuring potentials in a plasma. 3,614,606, Cl. 324-61.
Schmidt, Robert C., to Varian Associates. Microwave tuner having sliding contactors. 3,614,518, Cl. 315-5.53
Schmidt, Werner; and Hess, Rudolf, to Dravo Corporation. Open burner machines for sintering ores. 3,614,076, Cl. 266-21.
Schneider, Felix; Wagener, Paul-Werner; Neuser, Ernst; and Walser, Rudolf, to Rheinstahl Siegener Eisenbahnbedarf GmbH. Device for opening and closing sliding roof sections of a freight car. 3,613,311, Cl. 49-136.
Schneider, Robert A., to Spin Physics, Inc. Magnetic transducer with wear resistant pole tips. 3,614,339, Cl. 179-100.2
Schnell, Fred J.: *See—*
Hodges, Hato R.; and Schnell, Fred J.,3,614,574.
Schnellpressenfabrik Frankenthal, Albert & Cie: *See—*
Moos, Franz, 3,613,252.
Schnellpressenfabrik Frankenthal Albert & Cie. Aktiengesellschaft: *See—*
Moos, Franz; Loffler, Gerhard; and Brechtel, Arthur, 3,614,092.
Schnellpressenfabrik Koenig & Bauer Aktiengesellschaft: *See—*
Muth, Gregor Nikolaus; and Wolfram, Karl-Heinz, 3,613,576.
Schoen, Kurt, to Contraves AG. Particle counting apparatus. 3,614,607, Cl. 324-71.
Schoening, Werner Peter. Method and system for insulating pipes. 3,613,737, Cl. 138-149.
Schonfelder, Helmut, to Fernseh GmbH. Vector oscilloscope. 3,614,304, Cl. 178-5.04
Schover, Donald S.: *See—*
Adamski, Maxmilian; and Schover, Donald S.,3,613,564.
Schrader, George F.; and Vaiciunas, Alvinas A., to National Cash Register Company, The. Magnetic susceptibility tester. 3,614,618, Cl. 324-34.
Schreiber, August. Treating installation for sludge. 3,613,893, Cl. 210-272.
Schubert & Salzer Maschinenfibrik Aktiengesellschaft: *See—*
Schumann, Fritz; and Edler, Erich, 3,613,175.
Schubert, George E.; Swayze, Lloyd D.; and Waggoner, John B., to Caterpillar Tractor Company. Emergency supply system for vehicle hydraulic components. 3,613,818, Cl. 180-79.2
Schulman, Harold. Jewelry box. 3,613,873, Cl. 206-45.15
Schultz, John R.: *See—*
Schultze, Eckart F.; and Schultz, John R.,3,614,267.
Schultze, Eckart F.; and Schultz, John R., to Applied Power Industries, Inc. Two stage fluid pump. 3,614,267, Cl. 417-206.
Schuman, LeRoy J.: *See—*
Archer, Fred Curtis; Dediemar, Ronald B.; and Schuman, LeRoy J.,3,614,023.
Schumann, Fritz; and Edler, Erich, to Schubert & Salzer Maschinenfibrik Aktiengesellschaft. Method for inducing parting of fiber sliver between a can container-filling device and a container. 3,613,175, Cl. 19-157.
Schuricht, Henry A., to Hydromation Engineering Company. Mechanism for cyclically moving a parts accumulator- conveyor. 3,613,869, Cl. 198-220.
Schurman, Donald G.: *See—*
De Nobel, Richard W.; Schurman, Donald G.; Lindstadt, Theodore J., Jr.; and Koenig, Hans A.,3,613,619.
Schuster, Donald H., to Iowa State University Research Foundation. Peripheral vision display panel for automobile driver trainers. 3,613,263, Cl. 35-11.
Schutz, Eckert Franz: *See—*
Dinella, Donald; and Schutz, Eckert Franz,3,614,225.
Schwabenlender, Carl W., to Smith, A. O., Corporation. Vehicle frame unit. 3,614,124, Cl. 280-106.
Schwalm, Bruce D.: *See—*
Glass, Emmett F.; and Schwalm, Bruce D.,3,613,817.
Schwartz, Edward A.: *See—*
Del Vecchio, George D.; Schwartz, Edward A.; and Yarger, Norman L.,3,614,090.
Schwartzman, Gilbert. Single use applicator. 3,614,245, Cl. 401-132.
Schwarz, Francis C., to United States of America, National Aeronautics and Space Administration. Saturation current protection apparatus for saturable core transformers. 3,614,587, Cl. 321-2.
Schwarz, William W.; Flanigan, David A.; and Aycock, William C., to Thiokol Chemical Corporation. Differential pressure analyzer for propellant ingredients. 3,613,434, Cl. 73-35.
Schwarzbeck, John G., to Western Gear Corporation. Releasable mounting for power wheel. 3,613,852, Cl. 198-127.
Schwarzenberg, Karl-Heinz; and Michel, Rolf, to Demag Aktiengesellschaft. Means for securing of rolling mill rolls in particular those in stretch reducing mills. 3,613,429, Cl. 72-249.
Schwebel, Aldolf, to Mabeg Maschinenbau GmbH. Nachf. Hense & Pleines GmbH. Co. Supervisory device for a sheet feeder. 3,614,093, Cl. 271-56.
Schweihs, Richard F. Electrical connector unit. 3,614,709, Cl. 336-63.
Schwend, Fred N.: *See—*
Oldenburg, Kenneth F., 3,613,881.
Scientific and Industrial Research, Council of: *See—*
Mohan, Chandra; Rihal, Gursharan Singh; and Devgun, Balbir Singh, 3,613,798.
Scott, Richard H. Foam skimmer. 3,613,293, Cl. 46-44.
Scott, Richey L., to Bendix Corporation, The. Mass flowmeter. 3,613,451, Cl. 73-231.
Scott, Ronald F., to California Institute of Technology. Self-recording accelerometer. 3,613,446, Cl. 73-170.
Scovill Manufacturing Company: *See—*
Burbank, John Emerson, 3,613,180.
Taylor, Donald O., 3,613,181.
Scragg, Ernest, & Sons Limited: *See—*
Lee, Harold William, 3,613,467.
Scroggins, Haskell C. Material conveying machine. 3,613,926, Cl. 214-520.
Seabourn, Ed O., to Phillips Petroleum Company. Apparatus for installing underwater well equipment. 3,613,783, Cl. 166-0.5
Seaman, William J., to Chrysler Corporation. Wide angle biocular eyepiece. 3,614,209, Cl. 350-215.
Seberg, Harold A.; and Fitzgerald, Leo E. Method of fabricating a perforated panel for a vacuum work-holder or chuck. 3,613,208, Cl. 29-163.5
Secrist, Duane R.: *See—*
Cook, Miles H.; Nystrom, Walter; Secrist, Duane R.; and Turk, Harold L.,3,613,228.
Seeburg Corporation, The: *See—*
Bowman, Raymond D., 3,613,854.
Seeley, John Scott; Smith, Stanley Desmond; and Ritchie, Frederick Stafford. Cesium iodide interference filter with moisture resistant layer. 3,614,188, Cl. 350-1.
Segrest, Joseph D.: *See—*
Ireland, Ralph H.; and Segrest, Joseph D.,3,614,589.
Seguin, Ernest; and Whiteman, Max, said Seguin assor. to said Whiteman. Sectional balancing toy. 3,613,300, Cl. 46-131.
Seidel, Harold,, to Bell Telephone Laboratories, Incorporated. Generalized impedance-matched multibranch array. 3,614,647, Cl. 330-124.
Seidman, Solomon H. Ground transportation systems. 3,613,599, Cl. 104-18.
Semiconductor Research Foundation: *See—*
Nishizawa, Jun-Ichi; Kawakami, Shojiro; and Kiyasu, Zen'iti, 3,614,197.
Senior, Kenneth, to Stella-Meta Filters Limited. Method of making filter rings. 3,613,195, Cl. 29-412.
Serck Industries Limited: *See—*
Southall, John N., 3,613,519.
Shadle, Donald H., to General Machinery Company. Gripping elements for carbon anode stacker. 3,614,151, Cl. 294-104.
Shah, Dinesh S.; and Gardner, John F., to Xerox Corporation. Developer for electrostatic images. 3,613,637, Cl. 118-637.
Shah, Nayan S. Mechanically controlling flow through living body ducts. 3,613,661, Cl. 128-1.
Shakhov, Filipp Nikolaevich: *See—*
Mesheingisser, Mikhail Yakovlevich; Ermakov, Ivan Semenovich; Kochkin, Georgy Mikhailovich; Stankun, Alexandr Viktorovich; Shakhov, Filipp Nikolaevich; Velednitsky, Ilya Pinkhusovich; and Yagodin, Petr Petrovich,3,613,563.
Shamban, W. S., & Co.: *See—*
Traub, Henry A., 3,614,114.
Shapland, Earl P., to United States Steel Corporation. Operating and loading mechanism for slidable gates. 3,613,965, Cl. 222-505.
Shapleigh, Lloyd P., Jr.; and Difley, Charles R. Refuse compactor. 3,613,566, Cl. 100-218.
Sharachin, Yakov Afanasievich: *See—*
Ananiev, Lev Martemianovich; Pekker, Yakov Semenovich; Chakhlov, Vladimir Lukianovich; Sharachin, Yakov Afanasievich; Shtein, Mikhail Mikhailovich; and Yarushkin, Jury Pavlovich,3,614,638.

Sharki, Martin J.: *See—*
Rehm, William A.; Griffin, Phil H., III; and Sharki, Martin J.,3,614,761.

Shaw, Clyde C., to Coulter Electronics, Inc. Optical aerosol counter. 3,614,231, Cl. 356-37.

Shaw, Henry W.; and Lanford, Milton N., to Sound-Craft Systems, Inc. Remote functional control circuit. 3,614,321, Cl. 179-1.

Shaw, Leonard. Vehicle accelerator pedal lock. 3,613,410, Cl. 70-202.

Shell Oil Company: *See—*
Burrage, Eric C., 3,613,823.
Closmann, Philip J.; and Phocas, Dionysios M., 3,613,785.
Malott, Raymond A., 3,613,806.
Wahlstrom, Sven E., 3,614,753.

Sheridan, David S. Trocar catheters. 3,613,684, Cl. 128-347.

Sherwin-Williams Company, The: *See—*
Janke, Gilbert J., 3,613,770.

Shield, Richard; and Ramsey, Thomas H., to Texas Instruments, Incorporated. Miniaturized thin film inductors for use in integrated circuits. 3,614,554, Cl. 317-235.

Shields, Albert F., to S&S Corrugated Paper Machinery Co., Inc. Counterbalancing means for cutoff knives. 3,613,471, Cl. 74-393.

Shigeura, Junichi, to Mitsubishi Denki Kabushiki Kaisha. Shaft coupling device. 3,613,395, Cl. 64-9.

Shimokusu, Kazuo; Korekawa, Takashi; Hosokawa, Tomoyuki; Yamamoto, Taro; and Kobayasi, Takao, to Matsushita Electric Industrial Co., Ltd. Washing machine. 3,613,405, Cl. 68-12.

Shoh, Andrew, to Branson Instruments, Incorporated. Ultrasonic motion adapter for a machine tool. 3,614,484, Cl. 310-8.2

Shtein, Mikhail Mikhailovich: *See—*
Ananiev, Lev Martemianovich; Pekker, Yakov Semenovich; Chakhlov, Vladimir Lukianovich; Sharachin, Yakov Afanasievich; Shtein, Mikhail Mikhailovich; and Yarushkin, Jury Pavlovich,3,614,638.

Shuford, Emir H., Jr.; and Massengill, Herman Edward, Jr. Confidence testing device. 3,613,260, Cl. 35-8.

Shull, Bradford K., to Twin Disc, Incorporated. Power transmission having downshift inhibitor. 3,613,480, Cl. 74-733.

Shultz, James R.: *See—*
Bucek, Jiri B.; and Shultz, James R.,3,614,616.

Shute, Donald W., to Spacetac Incorporated. Class C bridge oscillator. 3,614,664, Cl. 331-110.

Shvarts, David Leonidovich: *See—*
Pesis, Izrail Mordukhovich; and Shvarts, David Leonidovich,3,614,568.

Sieber, Johannes Helmut: *See—*
Fuhring, Heinrich; and Sieber, Johannes Helmut,3,613,135.

Siebert, Raymond C., to Ampex Corporation. Bi-directional tape transport with reversible head mechanism driven by capstan motor. 3,614,342, Cl. 179-100.2

Siegel, Keeve M.: *See—*
Graham, Robert R.; Siegel, Keeve M.; and Vivian, Weston E.,3,614,778.

Siegelin, Werner: *See—*
Gawlick, Heinz; Marondel, Gunther; Bendler, Hellmut; and Siegelin, Werner,3,613,758.

Sieghartner, Leonard J., to Roth, Roy E., Company. Combination centrifugal-turbine pump. 3,614,256, Cl. 415-143.

Siegler, Edouard Horace, Jr.: *See—*
George, Kenyon P.; and Siegler, Edouard Horace, Jr.,3,614,227.

Siemens Aktiengesellschaft: *See—*
Behn, Reinhard; Hoyler, Gerhard; and Kessler, Hartmut, 3,614,561.
Guntersdorfer, Max, 3,614,559.
Gunther, Karl-Georg, 3,614,264.
Katz, Helmut; and Hubner, Erwin, 3,614,514.
Kaufmann, Kurt; Jerney, Rudolf; and Wandinger, Franz, 3,614,707.
Klein, Erwin; Koch, Werner; and Walz, Heinz, 3,613,308.
Stein, Karl-Ulrich, 3,614,752.
Topfer, Herbert; and Werr, Winfried, 3,614,329.

Silva, Antonio V., to Westinghouse Electric Corporation. Rolling mill automatic gauge control with compensation for transport time. 3,613,419, Cl. 72-8.

Silverman, Sarah K.: *See—*
Spector, Morris, 3,614,147.

Silverstein, Bernard, to RCA Corporation. Edge connector with polarizing member. 3,614,714, Cl. 339-186.

Simpkins, Robert L.; Karr, Joseph R.; and Lagg, Jerry W., to Raycon Corporation, mesne. Electrode-wear-compensating apparatus for and method of electric discharge machining. 3,614,371, Cl. 219-69.

Simpson, Ralph E.: *See—*
Nichols, William A.; and Simpson, Ralph E.,3,614,014.

Sinclair, Alex H.; and Otto, Robert J., to United States of America, Army. Unitized high mobility suspension and drive system for track vehicles. 3,614,125, Cl. 280-124.

Singer Company, The: *See—*
Dannatt, Hugh St. Lawrence, 3,614,471.

Singer, M Leonard; and Woletz, Robert M. Holding device for lock cylinders. 3,613,415, Cl. 70-447.

Sirotenko, Georgievich: *See—*
Folivorov, Vladimir Kikhailovich; Ukraintsev, Boris Nikolaevich; Sirotenko, Georgievich; Tinte, Aivar Eduardovich; Birger, Boris Lvovich; Vilnitis, Aivar Yanovich; Nadezhnikov, Nikita Mikhailovich; and Grinshteen, Mark Ilich,3,614,080.

Sitko, Robert H.: *See—*
Ohlsson, Leonard W.; and Sitko, Robert H.,3,613,389.

Sivin, Bernard J. Fire door drop-out. 3,613,765, Cl. 160-1.

Sjotun, Kyrre Guttorm: *See—*
Borchers, Alwin; Sjotun, Kyrre Guttorm; Hansen, Gunnar Lyshoj; and Clausen, Jorgen Rono,3,614,494.

Skilling, Edwin E. Method and apparatus for electrically depositing metal. 3,614,373, Cl. 219-69.

Skutt, Robert R.: *See—*
Coleman, William E.; and Skutt, Robert R.,3,614,769.

Slator, Damon T.; and Wilson, Archie, to Bowen Tools, Inc. Apparatus for controlling the wrapping of tubing onto a reel. 3,614,019, Cl. 242-157.1

Slavin, Martin J., to Phonplex Corporation. Attendant control panel system. 3,614,738, Cl. 340-163.

Slobodnik, Andrew J., Jr., to United States of America, Air Force. Microwave acoustic surface wave limiter and method of fabrication. 3,614,463, Cl. 307-88.3

Slobodnik, Andrew J., Jr., to United States of America, Air Force. Microwave acoustic surface wave amplifier and method of fabrication. 3,614,643, Cl. 330-5.5

Slumberland Group Limited: *See—*
Docker, Leslie Thomas, 3,613,196.

Slusser, Eugene A. Support tray for printed circuit boards. 3,614,540, Cl. 317-104.

Small Business Administration: *See—*
Thompson, Neal W., 3,613,550.

Small, John F.: *See—*
Small, Kenneth R.; and Small, John F.,3,613,453.

Small, Kenneth R.; and Small, John F., to Baker, J. E., Company, The. Rotary kiln sampling device. 3,613,453, Cl. 73-351.

Smiley, Parker C., to Physics International Company. Lever motion multiplier driven by electroexpansive material. 3,614,486, Cl. 310-8.2

Smit Nijmegen Electrotechische Fabrieter N. V.: *See—*
Van Riemsdijk, Gerardus A., 3,614,597.

Smith, A. O., Corporation: *See—*
Ciotti, George A., 3,614,602.
Schwabenlender, Carl W., 3,614,124.

Smith, A. O., Harvestore Products, Inc.: *See—*
Dissmeyer, Fred W.; and Olson, George E., 3,613,912.

Smith, Bernard, to Allegheny Ludlum Steel Corporation. Glass laser window sealant technique. 3,613,489, Cl. 29-472.7

Smith, Charles F.: *See—*
Stout, Caleb; Smith, Charles F.; and Nolan, Thomas J., III,3,613,790.

Smith, Charles Philip; and Wynne, John Roger, to Hobson, H. M., Limited. Constant speed drive. 3,613,367, Cl. 60-54.

Smith, Darrell S.: *See—*
Cannon, Lee E., 3,614,341.

Smith, Forrest P., Jr., to United States Surgical Corporation. Power pack unit. 3,613,507, Cl. 91-398.

Smith, Harold W.: *See—*
West, Emery C., 3,613,238.

Smith Kline & French Laboratories: *See—*
Hesselbo, Torben; and Groves, Arthur Derek George, 3,614,443.
Whitecar, Alten E., 3,613,861.

Smith Kline Instruments, Inc.: *See—*
Corbin, Thomas H.; and Kienitz, Martin E., 3,613,669.

Smith, Loran M. Hay swathing machine. 3,613,336, Cl. 56-2.

Smith, Richard A.; and Gutowski, Chester L., to Heinz, H. J., Company. Container filling apparatus and method. 3,613,746, Cl. 141-5.

Smith, Richard H.: *See—*
Buynak, George R.; Diamantides, Nicholas D.; and Smith, Richard H.,3,614,035.

Smith, Robert C., to Firestone Tire & Rubber Company, The. Digital computer control of polymerization process. 3,614,682, Cl. 235-151.12

Smith, Robert Harvey, to Sperry Rand Corporation. Remote electrically modulated relief valve. 3,613,717, Cl. 137-491.

Smith, Sidney R., Jr.; and Westendorp, Willem F., to General Electric Company. Triggered vacuum gap keep-alive circuit. 3,614,532, Cl. 317-16.

Smith, Stanley Desmond: *See—*
Seeley, John Scott; Smith, Stanley Desmond; and Ritchie, Frederick Stafford,3,614,188.

Smith, Thomas R., to Maytag Company, The. Drier control. 3,613,253, Cl. 34-45.

Smith, Thomas R. Drier control. 3,613,254, Cl. 34-45.

Smith, Trevor Stanley, to Lucas, Joseph, (Industries) Limited. Gas turbine fuel control systems. 3,613,362, Cl. 60-39.28

Snarr, James L.; and Hunt, Robert P., to Picker Corporation. Film processor. 3,613,547, Cl. 95-96.

Snider, Albert L.: *See—*
Cosman, Armond D.; and Snider, Albert L.,3,614,485.

Snyder, Roy C., Jr.; and Di Tore, Ralph M., to Egg Express, Inc. Egg shelling apparatus and method. 3,613,756, Cl. 146-221.

Snyder, Warren E.; Cavanaugh, John B.; and Aubin, Jean-Paul R., to AMBAC Industries, Incorporated. Minimum-maximum governor with full load torque control. 3,613,651, Cl. 123-140.

Sobkow, William J., to Ford Motor Company. Static air bag restraint device. 3,614,128, Cl. 280-150.

Sobkow, William J., to Ford Motor Company. Vehicle passenger restraint arrangement including a compartmentalized air bag. 3,614,129, Cl. 280-150.
Societe a Responsabilite Limitee: Societe Lampy d'Etudes et de Recherches 'S.O.L.E.R.'.*See*—
Chaveneaud, Roger Marcel; and Janoska, Georges, 3,614,330.
Societe Alsaciene de Constructions Mecaniques de Mulhouse: *See*—
Geiger, Bernard, 3,613,740.
Societe Anonyme Automobiles Citroen: *See*—
Fleury, Jacques,3,614,416.
Societe Anonyme pour l' Equipement Electrique des Vehicules:*See*—
Stellwagen, Jean Henri, 3,613,652.
Societe de Conditionnement en Aluminum Scal GP: *See*—
Normos, Norbert, 3,613,424.
Societe Genevoise d'Instruments de Physique:*See*—
Koulicovitch, Maurice; Pettavel, Jacques; and Wehrli, Pierre, 3,614,454.
Steinemann, Adolf; and Rufenacht, Jack, 3,614,236.
Societe Nationale d'Etude et de Construction de Moteurs d'Aviation:*See*—
Fournier, Jacques Maurice Armand, 3,614,407.
Societe Ormig.: *See*—
Gretchikhine, Nicolas, 3,613,572.
Societe Rhodiaceta: *See*—
Graham, Geoffrey P., 3,613,407.
Soda, Keiichi; and Ueki, Masayuki, to American Cyanamid Company. Spinning apparatus for sheath-core bicomponent fibers. 3,613,170, Cl. 18-8.
Soder, Robert, to Ebauches S.A. Method of manufacturing bearings, particularly micro-bearings. 3,613,202, Cl. 29-149.5
Soderkvist, Lars Olof Anton, to LKB-Produkter AB. Microtome. 3,613,492, Cl. 83-170.
Soejima, Tamihiko; Kajiura, Hiroshi; and Watanabe, Kinnosuke. Impact flow meter for powdery and granular materials. 3,613,449, Cl. 73-228.
Solarek, Thomas W., to Xerox Corporation. Materials for fibrous development member. 3,613,638, Cl. 118-637.
Solarek, Thomas W., to Xerox Corporation. Imaging system. 3,614,221, Cl. 355-3.
Someda, Sadamichi: *See*—
Hamano, Goro; and Someda, Sadamichi,3,614,405.
Sommer, Helmut; and Salerno, James, to United States of America, Army. Radar target identificationsystem. 3,614,779, Cl. 343-6.
Son, Marion O., Jr., to Marathon Oil Company. Method using micellar dispersions in multiple fracturing of subterranean formations. 3,613,789, Cl. 166-281.
Sonderegger, Hans Conrad; and Spescha, Gelli, to Kistler Instruments AG. Multi-component force transducer. 3,614,488, Cl. 310-8.6
Sonobe, Hisao: *See*—
Hirotsu, Tetsuji; and Sonobe, Hisao,3,614,564.
Sonoco Products Company: *See*—
Witzig, Werner, 3,613,738.
Sony Corporation: *See*—
Kojima, Koichi; and Nakamura, Tadahiko, 3,614,524.
Miyaoka, Senri; and Morio, Minoru, 3,614,500.
Ohgoshi, Akio; and Miyaoka, Senri, 3,614,501.
Soredal, Sven Gunnar, to LKB-Produkter Aktiebolag. Means for measuring the square of the strength of a magnetic field. 3,614,490, Cl. 310-25.
Sorensen, Ronald Jon, to Ampex Corporation. Reel and locking means for the outer end of the strip. 3,613,877, Cl. 206-53.
Sorrells, Frank D.: *See*—
Lee, Charles A.; and Sorrells, Frank D.,3,613,639.
Sound-Craft Systems, Inc.: *See*—
Shaw, Henry W.; and Lanford, Milton N., 3,614,321.
Soures, Nicholas M., to Xerox Corporation. Electrographic developer. 3,613,636, Cl. 118-637.
Southall, John N., to Serck Industries Limited. Pressure fluid operated actuators. 3,613,519, Cl. 92-125.
Southwire Company: *See*—
Cofer, Daniel B.; and Bass, Joseph A., 3,613,767.
Spacetac Incorporated: *See*—
Shute, Donald W., 3,614,664.
Spada, Albert J., to Avco Corporation. Means for separating ejecting and propelling overlying members. 3,613,907, Cl. 214-10.5
Sparton Corporation: *See*—
Hightower, Russell D.; and Aufill, Charles B., 3,613,455.
Speas, John L.: *See*—
Martin, Allen N.; and Speas, John L.,3,614,603.
Spector, Morris, to Silverman, Sarah K. Safety lock for trailer doors. 3,614,147, Cl. 292-254.
Spectra-Physics, Inc.: *See*—
Goldsborough, John P., 3,614,658.
Speer, Gordon W.; and Williamson, Dennis F., to Canadian General Electric Limited, mesne. Circuit for keeping the frequency of an inverter synchronized with the frequency of another source. 3,614,461, Cl. 307-64.
Speizman Industries, Inc.: *See*—
Starbuck, Leslie, 3,613,883.
Spencer, Arthur W. Tenter clamp positioning ridge. 3,613,182, Cl. 24-253.
Sperry Rand Corporation: *See*—
Breeden, Robert H., 3,613,730.
Glass, Emmett F.; and Schwalm, Bruce D., 3,613,817.
Hansen, Earl T., 3,614,646.
Longcoy, Richard L., 3,613,574.
Smith, Robert Harvey, 3,613,717.
Woodward, Benjamin W.; and Allard, John J., 3,614,578.
Spescha, Gelli: *See*—
Sonderegger, Hans Conrad; and Spescha, Gelli,3,614,488.
Spin Physics, Inc.: *See*—
Schneider, Robert A., 3,614,339.
Spitz, Harvey D. Perspiration absorbant sleeve for a racquet handle. 3,614,100, Cl. 273-75.
Spitz, Wolfgang, to Tobacco Research and Development Insitute Limited. Article feeding system. 3,614,166, Cl. 302-2.
Splan, Robert E. File box and file suspension device therefor. 3,614,185, Cl. 312-184.
Spohr, Hans Werner: *See*—
Hansgen, Klaus; Kinzler, Fritz; and Spohr, Hans Werner,3,613,139.
Sprenger, Gerhard: *See*—
Holken, Norbert; and Sprenger, Gerhard,3,614,141.
Spurlin, Joseph L., to Hughes Aircraft Company. Self-closing, 180° opening, concealed hinge. 3,613,152, Cl. 16-189.
Square D Company: *See*—
Dunham, Robert W.; and Vyskocil, Charles D., 3,614,697.
S&S Corrugated Paper Machinery Co., Inc.: *See*—
Shields, Albert F., 3,613,471.
St. Amand, James C.: *See*—
Zeigler, Philip B.; St. Amand, James C.; and Ranft, Ernst L.,3,613,944.
Stackhouse, Wells F.; and Barth, Douglas A., to American Locker Company, Inc. Coin controlled lock for two coins. 3,613,855, Cl. 194-51.
Stal-Laval Turbin Aktiebolag: *See*—
Norberg, Lars Arvid, 3,614,039.
Stamm, Richard R., to Superior Die Set Corporation. Ball bearing for die set leader pin. 3,614,178, Cl. 308-4.00c
Stampe, Henry M. Nut sorting machine. 3,613,882, Cl. 209-73.
Standard Oil Company: *See*—
Esau, Norman D., 3,613,438.
Standard Oil Company, The: *See*—
Talsma, Herbert E., 3,613,162.
Stanford Research Institute: *See*—
Cornsweet, Tom N.; Eilers, George J.; and Crane, Hewitt D., 3,614,214.
Heynick, Louis N.; and Westerberg, Eugene R., 3,614,423.
Stankun, Alexandr Viktorovich: *See*—
Mesheingisser, Mikhail Yakovlevich; Ermakov, Ivan Semenovich; Kochkin, Georgy Mikhailovich; Stankun, Alexandr Viktorovich; Shakhov, Filipp Nikolaevich; Velednitsky, Ilya Pinkhusovich; and Yagodin, Petr Petrovich,3,613,563.
Starbuck, Leslie, to Speizman Industries, Inc. Apparatus and method for transferring flaccid articles. 3,613,883, Cl. 209-74.
Stark, Robert J. Capsule reel assembly for tapes. 3,614,008, Cl. 242-55.16
Starliper, Ronald L., to Western Electric Company, Incorporated. Method and circuit for measuring effective capacitance of a semiconductive device. 3,614,614, Cl. 324-158.
Stauffer, John G. Electric boat steering system. 3,613,624, Cl. 114-144.
Stearns Electric Corporation: *See*—
Reiff, Donald H., 3,613,848.
Stearns, James B.; and Wendelburg, Robert W., to Chemetron Corporation. Arc welding supply having multiple control system. 3,614,377, Cl. 219-131.
Steel Heddle Manufacturing Company: *See*—
Julien, Robert, 3,614,017.
Steiman, Wolf, to Valve Corporation of America. Diaphragm actuated aerosol valve. 3,613,728, Cl. 137-614.19
Stein, David Howard: *See*—
Tuchinsky, Benjamin; Stein, David Howard; and Friedlander, Jeffrey J.,3,613,280.
Stein, Ira B. Automobile theft prevention device. 3,614,458, Cl. 307-10.
Stein, Karl-Ulrich, to Siemens Aktiengesellschaft. Storage arrangement with contact pressure device. 3,614,752, Cl. 340-173.
Steinback, Herbert D., to Magnecraft Electric Co. Coaxial relay. 3,614,671, Cl. 333-7.
Steinemann, Adolf; and Rufenacht, Jack, to Societe Genevoise d'Instruments de Physique. Apparatus for measuring length by optical interferometry. 3,614,236, Cl. 356-112.
Steinmaier, Walter: *See*—
Le Can, Claude Jan Principe Frederic; and Steinmaier, Walter,3,614,558.
Stella-Meta Filters Limited: *See*—
Senior, Kenneth, 3,613,195.
Stellwagen, Jean Henri, to Societe Anonyme pour l' Equipement Electrique des Vehicules, S.E.V. Marchal. Apparatus for automatically adjusting the timing of ignition of an internal combustion engine to correspond with the engine speed. 3,613,652, Cl. 123-146.5
Stemple, Eugene P.: *See*—
Brandts, Conrad W.; Stemple, Eugene P.; and Frazer, Richard A.,3,614,240.
Stepanek, Karel, to Vyzkumny ustav obrabecich stroju a obrabeni. Apparatus and method for measuring non-uniformities of

transmissions having a small transmission ratio. 3,613,439, Cl. 73-118.
Stern, Elliott; and Aaron, Richard L. Plastic embedded labeled articles. 3,613,265, Cl. 35-20.
Stetson, Earl W.; and Charewicz, Francis J., to General Electric Company. Sparkgap assembly having horngap end electrodes. 3,614,523, Cl. 315-36.
Stevens, J. P., & Co., Inc.: *See*—
Mazzone, Charles P.; and Pike, Herbert J., 3,613,186.
Stevens, J. P., & Company, Inc.: *See*—
Lauck, Peter, III, 3,614,391.
Stevens, Milton J. Ferrule unit for fishing rods and method of construction. 3,614,143, Cl. 287-126.
Stewart, Wilber Clarence; and Cosentino, Louis Salvatore, to RCA Corporation. Holographic memory with illumination hologram providing reference and object beams. 3,614,189, Cl. 350-3.5
Stewart-Warner Corporation: *See*—
Goldberg, Joel C.; and Gray, Dudley, 3,614,306.
Steyr, John; and Topler, Ernest. Lamp harp swivel. 3,614,138, Cl. 287-20.3
Stibbe, Paul H., to Case, J. I., Company. Drive belt assembly for tractor mounted implement. 3,613,462, Cl. 74-15.4
Stier, Henry W., to Carmet Company. Threading insert. 3,613,197, Cl. 29-95.
Stierlen-Werke Aktiengesellschaft: *See*—
Pilz, Erwin; Vetter, Klaus; and Pankratz, Rudolf, 3,613,933.
Still, Carl, Firma: *See*—
Knappstein, Johannes, 3,613,913.
Stirling, Hugh R.: *See*—
Grubel, Stanley J.; and Stirling, Hugh R.,3,614,609.
Stirrat, Alexander Young. Casting apparatus. 3,613,167, Cl. 18-26.
Stites, David G., to Itek Corporation. Bright line reticle apparatus and optical alignment methods. 3,614,238, Cl. 356-124.
Stocks, Leon; and Castle, John Frederick, to Broken Hill Associated Smelters Proprietary Limited, The. Spiral launders. 3,614,081, Cl. 266-34.
Stoeckinger, Gerald R.: *See*—
Goodell, Stuart E.; and Stoeckinger, Gerald R.,3,614,378.
Stohrer, George D. Cam controlled toy vehicle. 3,613,302, Cl. 46-202.
Stoll, Oskar: *See*—
Thevis, Paul; Frobel, Artur; and Stoll, Oskar,3,613,857.
Stoner, Thomas A.: *See*—
Lindstad, Jon R.; and Stoner, Thomas A.,3,613,805.
Stookey, George K.: *See*—
Muhler, Joseph C.; and Stookey, George K.,3,613,143.
Stoops, Wayne K.: *See*—
Motts, Paul V.; and Stoops, Wayne K.,3,613,548.
Stoppard, William E., to Leesona Corporation. Bobbin handling apparatus. 3,613,862, Cl. 198-33.0aa
Storage Technology Corporation: *See*—
Herger, Zoltan L., 3,614,020.
Stork, Willi; and Haupt, Karl, said Haupt assor. to Windmoller & Holscher. Apparatus for automatically charging a stack magazine of a bag-making machine with tube section stacks. 3,613,529, Cl. 93-93.
Stout, Caleb; Smith, Charles F.; and Nolan, Thomas J., III, to Dow Chemical Company, The. Method of plugging a formation. 3,613,790, Cl. 166-294.
Stout, William H. Moving irrigation system. 3,613,703, Cl. 137-1.
Stram, George H.; Williams, Ralph J.; Altland, George E.; and Dunn, Thomas J., to Dentsply International Inc. Dental cuspidor. 3,613,131, Cl. 4-263.
Stroup, James G. Dribble teaching aid. 3,613,116, Cl. 2-12.
Stuart, Robert W.: *See*—
Hogan, Walter H.; and Stuart, Robert W.,3,613,385.
Stum, Linly R. Implement carrier. 3,613,925, Cl. 214-394.
Stumpp, Gerhard; and Peters, Klaus-Jurgen, to Bosch, Robert, G.m.b.H. Fuel injection system for internal combustion engines. 3,613,650, Cl. 123-119.
Sturm, Rolland G.; and Coon, John M. Manned, mobile submersible. 3,613,615, Cl. 114-16.
Subcom, Inc.: *See*—
Cohen, Paul, 3,613,640.
Sudoh, Toshiaki, to Nippon Electric Company, Limited. Double balanced modulators of the current switching type. 3,614,668, Cl. 332-24.
Sues, Lawrence B., to United States of America, Air Force. Magnetic packaging module. 3,614,629, Cl. 325-355.
Suhonen, Tapani: *See*—
Levamaki, Reijo; Vehvilainen, Mikko; and Suhonen, Tapani,3,613,582.
Sulzer Brothers, Ltd.: *See*—
Konig, Ferdinand, 3,614,566.
Sumitomo Metal Industries, Ltd: *See*—
Nara, Akinao; and Ono, Masahisa, 3,613,418.
Summers, Kenneth L., to Rieke Corporation. Nestable pouring spout with wall-supporting cap. 3,613,966, Cl. 222-529.
Sun Electric Corporation: *See*—
Halinski, Michael J.; and Wanschek, Larry, 3,614,522.
Superior Continental Corporation: *See*—
Roberts, Walter L.; and Newton, Henry Lynn, 3,614,323.
Superior Die Set Corporation: *See*—
Stamm, Richard R., 3,614,178.
Superior Electric Company, The: *See*—
Gmuer, Thomas C., 3,614,599.
Supermarket Service, Inc.: *See*—
Loughran, Anthony, 3,613,567.
Supramar AG: *See*—
Bueller, Karl, 3,613,622.
Sussman, Irving. Easy loading fishing reel. 3,614,015, Cl. 242-84.1
Sutliff, Robert C.: *See*—
Kohler, John C.; Sutliff, Robert C., and Zollo, Corrado,3,613,876.
Suyama, Nobuyuki: *See*—
Fujimoto, Kyohei; and Suyama, Nobuyuki,3,614,729.
Suzaki, Hideyuki: *See*—
Ichimori, Masuo; and Suzaki, Hideyuki,3,613,123.
Suzuki, Hideo, to Mitsui Shipbuilding and Engineering Co., Ltd. Slurry tanker. 3,613,623, Cl. 114-73.
Suzuki, Isamu, to Tomy Kogyo Co., Ltd. Vertically and horizontally movable toy. 3,613,305, Cl. 46-206.
Suzuki, Yasuo; and Kameyama, Yasuyoshi, to Matsushita Denko Kabushiki Kaisha. Synchronous motor. 3,614,495, Cl. 310-162.
Svaldi, Marvin A.: *See*—
Jones, Stanley C.; Roszelle, Wayne O.; and Svaldi, Marvin A.,3,613,786.
Svecharnik, David Veniaminovich: *See*—
Yalyshev, Aly Umyarocivh; Svecharnik, David Veniaminovich; Pavlenko, Vladimir Alexandrovich; Tsarkov, Vyacheslav Alexeevich; Bonch-Bruevich, Andrei Mikhailovich; and Levinson, Boris Alexandrovich,3,614,633.
Svereika, Edward: *See*—
Pool, Stuart D.; Meitl, Harold G.; Rickerd, Calvin P.; Middlesworth, Tommy A.; Findlay, Jack B.; Thayer, Arlie J.; and Svereika, Edward,3,613,342.
Svereika, Mary J.: *See*—
Pool, Stuart D.; Meitl, Harold G.; Rickerd, Calvin P.; Middlesworth, Tommy A.; Findlay, Jack B.; Thayer, Arlie J.; and Svereika, Edward,3,613,342.
Swander, Kenneth D., Jr.; and Wearden, Charles G., to Certain-Teed Products Corporation. Brake actuator. 3,613,515, Cl. 92-63.
Swansen, Raymond, Jr.: *See*—
Zernov, Peter; and Swansen, Raymond, Jr.,3,614,087.
Swayze, Lloyd D.: *See*—
Schubert, George E.; Swayze, Lloyd D.; and Waggoner, John B.,3,613,818.
Sweattie, Juel G.: *See*—
Kroeger, Richard A.; and Sweattie, Juel G.,3,613,867.
Sweda, Adam D.: *See*—
Tantlinger, Keith W.; and Sweda, Adam D.,3,614,153.
Sweeney, James W., to University of Oklahoma Research Institute, The. Generalized information processing. 3,614,744, Cl. 340-172.5
Sweetheart Plastics, Inc.: *See*—
Davis, Paul, 3,613,940.
Sybron Corporation: *See*—
Hallenbeck, Bennett, 3,614,539.
Sylvania Electric Products, Inc.: *See*—
Allgaier, William A., 3,614,513.
Beach, David E., 3,614,413.
Boelke, Gilbert L., 3,614,676.
Lieberman, Daniel, 3,614,644.
Syvakari, Perti: *See*—
Landa, Torstein; Syvakari, Perti; and Westman, Erik,3,613,157.
Taft, William E., to United States of America, Atomic Energy Commission. Pneumatic control rod drive including a scram cushion. 3,613,512, Cl. 92-13.8
Taguchi, Tatsuya; and Watanabe, Yoshiaki, to Canon Kabushiki Kaisha. Warning device for exposure meter. 3,613,536, Cl. 95-10.
Tajima, Masahaur: *See*—
Tanabe, Yutaka; and Tajima, Masahaur,3,613,192.
Takada, Norio, to Yamaha Hatsudoki KabushikiKaisha. Method of making a frame assembly of an endless- belt traction midget snow vehicle. 3,613,205, Cl. 29-155.
Takashima, Yoichi: *See*—
Oyama, Yoshitoshi; Takashima, Yoichi; and Aoki, Shigebumi,3,613,989.
Takimura, Shojiro; Doi, Tomeji; and Kuawamoto, Hiroshi. Metal rolling work roll and method of making same. 3,613,319, Cl. 51-289.
Talley, James C.; and Potteiger, Lester A., to United States of America, Navy. Formed wire fragmentation device. 3,613,586, Cl. 102-67.
Talsma, Herbert E., to Standard Oil Company, The. Apparatus for the formation of helical plastic pipe. 3,613,162, Cl. 18-14.
Tanabe, Yutaka; and Tajima, Masahaur, to Ikegai Tekko Kabushiki Kaisha. Tool spindle assembly. 3,613,192, Cl. 29-26.
Tanner, Carole S., to Rohr Corporation. Ejector with suppresor chutes. 3,613,996, Cl. 239-265.13
Tantlinger, Keith W.; and Sweda, Adam D., to Fruehauf Corporation. Universal trailer chassis. 3,614,153, Cl. 296-35.
Taormina, Anthony J.; and Witek, Roman J., Jr., to Essex International, Inc. Appliance mounting apparatus. 3,614,712, Cl. 339-127.
Tapp, James S.; Colwell, Robert E.; and Toney, Myron K., to Monsanto Company. Controlled-form centrifugal precipitation apparatus. 3,613,988, Cl. 233-2.
Tarner, Jack, to Phillips Petroleum Company. Method of supporting warm pipeline in arctic region. 3,613,380, Cl. 61-46.
Tate, Malcolm C.: *See*—
Bradley, Chester D.; and Tate, Malcolm C.,3,613,517.

Tauson, Peter O.: *See—*
Tobin, Joseph M.; Tauson, Peter O.; Fleischer, Leonard R.; and Ebner, Harry F.,3,613,655.
Tavelle, Charles L.: *See—*
Rowland, Le Roy R.; and Tavelle, Charles L.,3,613,168.
Taylor, Donald O., to Scovill Manufacturing Company. Snap fastener socket. 3,613,181, Cl. 24-216.
Taylor, George William, to RCA Corporation. Light valve matrix. 3,614,200, Cl. 350-150.
Te Company, The: *See—*
Harris, Clyde W., 3,614,194.
Teeter, George R. Minning machine, cutting structure. 3,614,162, Cl. 299-67.
Teledyne, Inc.: *See—*
Benson, James M.; and Easter, Edmond, 3,613,448.
Ramey, Robert M., 3,614,281.
Teleflex Gesellschaft mit beschrankter Haftung: *See—*
Meissner, Willi; and Wieltsch, Horst, 3,613,148.
Telefonaktiebolaget L M Ericsson: *See—*
Alexandersson, Harald Valdemar, 3,614,360.
Telefunken Patentverwertungsgesellschaft m.b.H.: *See—*
Borner, Manfred; and Goldbach, Gunter, 3,614,661.
Ehlbeck, Heinz-Wilhelm; and Engbert, Reiner, 3,614,468.
Teletype Corporation: *See—*
Glorioso, Charles A., 3,614,315.
Tenneco Inc.: *See—*
Du Bois, Bert, 3,613,828.
Palmer, Charles L., 3,613,829.
Teranishi, Yuichi, to Hitachi, Ltd. FET flip-flop driving circuit. 3,614,476, Cl. 307-279.
Terayama, Yuji: *See—*
Ishikawa, Shigeji; Terayama, Yuji; and Wada, Masuhiro,3,613,447.
Terrell, Jerry W.: *See—*
Krallinger, Robert E.; Keplinger, Edward G.; and Terrell, Jerry W.,3,614,319.
Tester, Norman William: *See—*
Dymoke-Bradshaw, Leslie Eugene Basil; and Tester, Norman William,3,614,335.
Testone, Anthony Q., to Testone Electrostatics Corporation. Laminating apparatus and method. 3,614,562, Cl. 317-262.
Testone Electrostatics Corporation: *See—*
Testone, Anthony Q., 3,614,562.
Teuschler, Hans-Joachim, to Kombinat VEB Elektonische Bauelemente. Insulated gate field effect transistors. 3,614,552, Cl. 317-235.
Teves, Alfred, G.m.b.H.: *See—*
Oberthur, Heinrich, 3,613,710.
Texaco Inc.: *See—*
Knowles, Edwin C.; and Mc Coy, Frederic C., 3,613,658.
Richter, Albert P., Jr.; and Bruner, James D., 3,614,726.
Texas Instruments, Incorporated: *See—*
Choate, William C., 3,614,398.
Fournier, Gerald R.; and Baker, Charles E., 3,614,312.
Hahn, Larry Alan, 3,614,474.
Haisty, Robert W.; Johnson, Rowland E.; and Mehal, Edward W., 3,613,226.
Jones, James J.; Oxford, David B.; and Zuch, Howard W., 3,614,634.
Shield, Richard; and Ramsey, Thomas H., 3,614,554.
Watson, William J.; and Kastner, William D., 3,614,742.
Texpatent GmbH: *See—*
Fecker, Josef, 3,613,399.
Textron Inc.: *See—*
Brandli, Ronald I.; Klema, Lawrence E.; and Reese, Garald D., 3,613,811.
Hetteen, Donnelly L.; and Reese, Gerald D., 3,613,810.
Hughes, George C., 3,613,725.
Thayer, Arlie J.: *See—*
Pool, Stuart D.; Meitl, Harold G.; Rickerd, Calvin P.; Middlesworth, Tommy A.; Findlay, Jack B.; Thayer, Arlie J.; and Svereika, Edward,3,613,342.
Theurer, Josef: *See—*
Plasser, Franz; and Theurer, Josef,3,613,598.
Thevis, Paul; Frobel, Artur; and Stoll, Oskar, to Olympia Werke Aktiengesellschaft. Ribbon transporting and shifting mechanism. 3,613,857, Cl. 197-151.
Thieme, Klaus Dietrich: *See—*
Hermes, Heinz; Hinterthur, Helmut; Otto, Arnold; Thieme, Klaus Dietrich; and Westhoff, Heinz,3,614,723.
Thiokol Chemical Corporation: *See—*
Kennedy, Carroll Trowbridge, 3,613,612.
Ritchey, Harold W., 3,613,374.
Schwarz, William W.; Flanigan, David A.; and Aycock, William C., 3,613,434.
Thomas, Arthur L.: *See—*
Hedrick, Robert R.; and Thomas, Arthur L.,3,613,863.
Thomford, William E.: *See—*
Jaekle, William M.; Garin, Paul V.; Thomford, William E.; Greb, Wallace M.; Udaloff, Nicholas N.; and Peery, Stephen H., Jr.,3,613,914.
Thompson, Bruce R.: *See—*
Rothauser, Charles; and Thompson, Bruce R.,3,614,059.
Thompson, Francis T.; and Vercellotti, Leonard C., to Westinghouse Electric Corporation. Frequency demodulator. 3,614,641, Cl. 329-110.
Thompson, John T.: *See—*
Gillemot, George W.; and Thompson, John T.,3,614,295.
Thompson, John T.; and Gillemot, George W. Cable splice casing with conductive anchorage to cable sheath and shield. 3,614,298, Cl. 174-92.
Thompson, Neal W., to Small Business Administration, mesne. Apparatus for cooking foodstuffs. 3,613,550, Cl. 99-330.
Thompson, Richard G., to L & A Products, Inc. Acid aspirator system. 3,613,997, Cl. 239-310.
Thresher, Richard G.; Kosar, John P.; and Harper, James F. Mechanical counting fuze. 3,613,593, Cl. 102-76.
Tiebow Company Limited: *See—*
Otsuka, Katsumi, 3,614,247.
Tiffany Industries, Inc.: *See—*
Mohr, Robert G., 3,614,158.
Tillstrom, Carl R.: *See—*
Crump, Ralph E.; Reynolds, Frank L.; and Tillstrom, Carl R.,3,613,689.
Tinkham, Leland P., to Clayton Manufacturing Company. Brake pedal pressure signal sending unit. 3,613,440, Cl. 73-132.
Tinte, Aivar Eduardovich: *See—*
Folivorov, Vladimir Kikhailovich; Ukraintsev, Boris Nikolaevich; Sirotenko, Georgievich; Tinte, Aivar Eduardovich; Birger, Boris Lvovich; Vilnitis, Aivar Yanovich; Nadezhnikov, Nikita Mikhailovich; and Grinshteen, Mark Ilich,3,614,080.
Tobacco Research and Development Insitute Limited: *See—*
Spitz, Wolfgang, 3,614,166.
Tobin, Joseph M.; Tauson, Peter O.; Fleischer, Leonard R.; and Ebner, Harry F., to Westinghouse Electric Corporation. Centrifugal gun. 3,613,655, Cl. 124-6.
Todd, David B.: *See—*
Loomans, Bernard A.; and Todd, David B.,3,613,160.
Toepfer, Richard E.: *See—*
Hill, Robert Curtis; French, John M.; and Toepfer, Richard E.,3,614,450.
Tokyo Gas Company Limited: *See—*
Yamaguchi, Tamio, 3,614,280.
Tokyo Shibaura Co., Ltd.: *See—*
Koike, Hiroshi; and Fujita, Rokuro, 3,614,354.
Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Iida, Masachika; and Imajo, Yasutaka, 3,614,687.
Koike, Hiroshi; and Fujita, Rokuro, 3,614,354.
Tokyo Shibaura Electric Co., Ltd.: *See—*
Fukatsu, Akihiro; and Yokohama, Kato, 3,614,505.
Nakamura, Tetsuji, 3,614,556.
Yoshio, Toshihiko, 3,614,353.
Tomaro, Patrick M., to Remco Industries, Inc. Toy rowing boat and actuating mechanism. 3,613,297, Cl. 46-93.
Tomasch, Franz A.: *See—*
Beck, Christian A.; and Tomasch, Franz A.,3,614,095.
Tomy Kogyo Co., Ltd.: *See—*
Arai, Toshikatsu, 3,613,306.
Suzuki, Isamu, 3,613,305.
Toney, Myron K.: *See—*
Tapp, James S.; Colwell, Robert E.; and Toney, Myron K.,3,613,988.
Tonolli, A., & C., S.p.A.: *See—*
Tremolada, Gustavo, 3,614,003.
Topfer, Herbert; and Werr, Winfried, to Siemens Aktiengesellschaft. Telephone exchange installation having auxiliary services. 3,614,329, Cl. 179-18.
Topler, Ernest: *See—*
Steyr, John; and Topler, Ernest,3,614,138.
Torrence, James D.: *See—*
Burkhardt, Edgar S.; and Torrence, James D.,3,614,004.
Torres, Jorge, to Purolator Products, Inc. Balanced pressure coupling. 3,613,726, Cl. 137-614.03
Tosch, William C.; and Wenger, Charles B., to Marathon Oil Company. Secondary oil recovery process using micellar dispersions. 3,613,787, Cl. 166-273.
Totel Systems Corporation: *See—*
Galian, John N.; and Kuryla, Bruce S., 3,614,325.
Toth, Alex, to Ellis Corporation. Commercial laundry machine. 3,613,406, Cl. 68-140.
Touchstone, Roy Henry. Quick slack adjuster for locomotive brakes. 3,613,840, Cl. 188-197.
Towlsaver, Inc.: *See—*
Perrin, Jack L., 3,613,880.
Townsend Engineering Company: *See—*
Townsend, Ray T., 3,613,154.
Townsend, Nicholas A.; and Oxlade, Roy R., to British Iron and Steel Research Association, The. Rolling mills. 3,613,428, Cl. 72-237.
Townsend, Ray T., to Townsend Engineering Company. Fish skinning device. 3,613,154, Cl. 107-62.
Townsend, Richard E., to Fairchild Hiller Corporation. V/stol aircraft. 3,614,034, Cl. 244-56.
Toyo Bearing Manufacturing Company: *See—*
Hasegawa, Hisao; and Sanami, Masashi, 3,613,398.
Toyoda Koki Kabushiki Kaisha: *See—*
Eto, Kunihiko, 3,614,580.

Trachtenberg, Murray S.: *See—*
Zimmet, Arthur L.; and Chernack, Milton P., 3,614,760.
Tracor, Inc.: *See—*
Anthony, Albert M., 3,614,688.
Transportation Technology, Inc.: *See—*
Mackie, Harry A.; and Ross, Howard R., 3,613,822.
Traub, Henry A., to Shamban, W. S., & Co. Seal assembly. 3,614,114, Cl. 277-165.
Traub Vertriebsgesellschaft mbH., Firma: *See—*
Werkmeister, Johannes; and Scheler, Holger, 3,613,487.
Treacy, Edmond B., to United Aircraft Corporation. Adaptive pulse echo target identification system. 3,614,719, Cl. 340-3.
Treanor, Eugene J. Safety closure with seal. 3,613,929, Cl. 215-9.
Treiber, Gottlieb H. Wire winding tool. 3,613,745, Cl. 140-118.
Tremolada, Gustavo, to Tonolli, A., & C., S.p.A. Apparatus for selectively crushing of storage batteries and separating the component materials. 3,614,003, Cl. 241-79.3
Trimmer, James E., to Precise Forms, Inc. Ledger form for concrete structures. 3,614,051, Cl. 249-27.
Trinite, George M., Jr., to United States of America, Navy, mesne. Radar presentation simulator. 3,614,286, Cl. 35-10.4
Triplett, Lee. Ferrule type friction-lock device. 3,613,496, Cl. 85-69.
Tripodi, Peter R., to Liggett & Myers Incorporated, mesne. Dispensing apparatus for pliable sheet form material in stacked relation. 3,613,949, Cl. 221-310.
Troeger, Henry, to Bendix Corporation, The. Centrifugal and torque responsive clutch. 3,613,850, Cl. 192-105.
Trojan, Inc.: *See—*
Harrison, James E., 3,614,139.
Troton, Jacques, to Compagnie des Ateliers et Forges de la Loire. Method of manufacturing aluminum bronze- stainless steel bimetallic plates. 3,614,379, Cl. 219-137.
Trowbridge, John C.: *See—*
Lai, William; and Trowbridge, John C.,3,613,583.
Trusselle, William H., to Pneumatic Scale Corporation. Filling head for container filling machine. 3,613,747, Cl. 141-198.
TRW Inc.: *See—*
Goff, Raymon L., 3,613,364.
Hayden, Rodney; and Guarasci, Mario, 3,614,770.
Heath, Clarence Willans, 3,614,713.
Heflinger, Lee O., 3,614,234.
Herbenar, Edward J., 3,613,201.
Warin, Francis J., 3,613,500.
Tsarkov, Vyacheslav Alexeevich: *See—*
Yalyshev, Aly Umyarocivh; Svecharnik, David Veniaminovich; Pavlenko, Vladimir Alexandrovich; Tsarkov, Vyacheslav Alexeevich; Bonch-Bruevich, Andrei Mikhailovich; and Levinson, Boris Alexandrovich,3,614,633.
Tsubouchi, Kaoru, to Aisin Seiki Kabushiki Kaisha. Mechanical brake system of dis-type. 3,613,837, Cl. 188-72.9
Tsudakoma Industrial Co., Ltd.: *See—*
Arakawa, Kazuyuki, 3,613,470.
Tsuru, Hideyuki: *See—*
Yashiike, Chikas; Tsuru, Hideyuki; and Yoshiike, Yoichi,3,613,257.
Tsymbal, Claude, to Institut de Recherches de la Siderurzie Francaise. Metallurgical apparatus. 3,614,082, Cl. 266-38.
Tu, George K., to Cogar Corporation. Non-saturated logic circuits compatible with TTL and DTL circuits. 3,614,467, Cl. 307-215.
Tuchinsky, Benjamin; Stein, David Howard; and Friedlander, Jeffrey J. Picture framing kit. 3,613,280, Cl. 40-155.
Turbo Machine Company: *See—*
Carruthers, George A., 3,613,347.
Turbo-Compressor Engine Corporation: *See—*
Rifkin, Frank, 3,613,361.
Turk, Harold L.: *See—*
Cook, Miles H.; Nystrom, Walter; Secrist, Duane R.; and Turk, Harold L.,3,613,228.
Turner, William L.; Campbell, William H.; and Mercer, Robert E. Combination vanity stool or seat and luggage rack. 3,614,155, Cl. 297-129.
Twin Disc, Incorporated: *See—*
Mc Roberts, Richard C.; and Arnold, Bruce C., 3,613,469.
Shull, Bradford K., 3,613,480.
Tyler, Hugh J.: *See—*
Willson, James R.; Krueger, Keith T.; Tyler, Hugh J.; and Jackson, Wilbur F.,3,613,732.
Uchiyama, Takashi: *See—*
Yazaki, Mutsunobu; and Uchiyama, Takashi,3,613,534.
Udaloff, Nicholas N.: *See—*
Jaekle, William M.; Garin, Paul V.; Thomford, William E.; Greb, Wallace M.; Udaloff, Nicholas N.; and Peery, Stephen H., Jr.,3,613,914.
Uddeholms Aktiebolag: *See—*
Holm, Kurt Anders, 3,613,699.
Ueki, Masayuki: *See—*
Soda, Keiichi; and Ueki, Masayuki,3,613,170.
Uhl, James F. Process for collecting waste materials. 3,613,215, Cl. 29-403.
Ukraintsev, Boris Nikolaevich: *See—*
Folivorov, Vladimir Kikhailovich; Ukraintsev, Boris Nikolaevich; Sirotenko, Georgievich; Tinte, Aivar Eduardovich; Birger, Boris Lvovich; Vilnitis, Aivar Yanovich; Nadezhnikov, Nikita Mikhailovich; and Grinshteen, Mark Ilich,3,614,080.
Uleski, Robert E. Plasma compression apparatus. 3,614,525, Cl. 315-111.
Ulrich, Reinhard: *See—*
Martin, Raymond J.; and Ulrich, Reinhard,3,614,198.
Ultee, Casper J., to United Aircraft Corporation. Laser employing aliphatic nitriles as a lasing gas. 3,614,660, Cl. 331-94.5
Ultronic Systems Corporation: *See—*
Huber, George H.; Gertler, Eugene I.; Habgood, Dennis W.; Ciarrocchi, John A.; and Richman, Walter A., 3,614,765.
Umemura, Yukio: *See—*
Mita, Kunio; and Umemura, Yukio,3,613,543.
Unarco Industries, Inc.: *See—*
Moyer, Harris P., 3,613,128.
Unger, Harold W.: *See—*
Loritz, Edward F.; and Unger, Harold W.,3,613,613.
Union Carbide Corporation: *See—*
Holmes, Ronald L. W., 3,614,083.
Union Pump Company: *See—*
Freed, Jacob B.; and Disbrow, Donald R., 3,614,060.
Union Special Machine Company: *See—*
Hayes, Robert A.; and Frendreis, James A., 3,613,609.
Uniroyal Englebert France S.A.: *See—*
Leblond, Jean; and Biet, Jean, 3,613,903.
United Aircraft Corporation: *See—*
Abild, Robert N., 3,613,375.
Fiedorowicz, John J.; and Lamonde, Romeo L., 3,613,634.
Pinsley, Edward A.; and Brown, Clyde O., 3,614,656.
Richmond, Irving D., 3,614,784.
Treacy, Edmond B., 3,614,719.
Ultee, Casper J., 3,614,660.
United Engineering and Foundry Company: *See—*
Adair, James Richard; and Bifasiewicz, Tadeusz M., 3,613,426.
United Kingdom Atomic Energy Authority: *See—*
Davies, Alan, 3,614,588.
Perry, Kenneth Edward Gordon, 3,614,429.
United Kingdom of Great Britain and Northern Ireland, Minister of Technology in Her Britannic Majesty's Government of the:*See—*
Goldsmith, Eustace Laurence, 3,613,704.
United Kingdon Atomic Energy Authority: *See—*
Maskell, Clifford William Alfred, 3,614,510.
United States America, Interior: *See—*
Brown, Clinton E., 3,613,779.
United States of America
Air Force: *See—*
Brueschke, Erich E., 3,614,521.
Goggins, William B., Jr., 3,614,786.
Kissell, Kenneth E., 3,614,239.
Lai, William; and Trowbridge, John C., 3,613,583.
Meeks, Crawford R., 3,614,181.
Montanino, Louis N.; and Pearson, William E., 3,614,026.
Nanevicz, Joseph E., 3,614,529.
Quinn, John S.; and Murch, Walter G., 3,613,991.
Reagan, Michael H., 3,614,043.
Slobodnik, Andrew J., Jr., 3,614,463.
Slobodnik, Andrew J., Jr., 3,614,643.
Sues, Lawrence B., 3,614,629.
Army: *See—*
Apstein, Maurice; Blomgren, Evert; Keehn, George R.; Andrews, Laurence M.; and Rabinow, Jacob, 3,613,589.
Blomgren, Evert; and Baker, James L., 3,613,595.
Bonvallet, Duane J., 3,614,334.
Burke, John F., 3,613,594.
Dubroff, Stanley, 3,613,585.
Frost, Emerson L., 3,614,581.
Johnston, James V.; and Hutcheson, Guilford J., Jr., 3,613,458.
Kubanoff, Jacob H., 3,614,637.
Lenton, Donald R., 3,613,591.
Lewis, Charles Lynn, 3,614,027.
Minnich, Violet C.; and Krueger, Walter J., 3,613,191.
Nirschl, Joseph C., 3,614,444.
Papirno, Ralph P., 3,613,441.
Reed, Sherwood, 3,613,889.
Rogge, Bernhard, 3,613,935.
Sinclair, Alex H.; and Otto, Robert J., 3,614,125.
Sommer, Helmut; and Salerno, James, 3,614,779.
Wales, Nathaniel B., Jr., 3,613,579.
Atomic Energy Commission: *See—*
Brown, William L.; and Portlock, John M., 3,614,724.
Kenderdine, Eugene W., 3,614,465.
Koontz, Roland F., 3,614,694.
Schmidt, John A.; and Kerst, Donald W., 3,614,606.
Taft, William E., 3,613,512.
Wilson, Richard G., 3,614,670.
National Aeronautics and Space Administration, Administrator, with respect to an invention of:
Davis, Lawrence P., Crutcher, James E., and Weidenhamer, Jerald H. Isolation coupling arrangement for a torque measuring system. 3,613,457, Cl. 73-133.
Easton, Richard A., and Hulbert, Edward E. Data multiplexer using tree switching configuration. 3,614,327, Cl. 179-15.
Finley, Wallace R., and Cox, Jay A. Analog to digital converter. 3,614,772, Cl. 340-347.
Knauer, Wolfgang, and Poeschel, Robert L. Ion thruster. 3,613,370, Cl. 60-202.

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National Aeronautics and Space Administration: *See—*
Byrne, Frank, 3,614,648.
Deboo, Gordon J., 3,614,475.
Holmstrom, Frank R., 3,614,557.
Lyon, William E., 3,614,228.
McFadin, Louis W., 3,613,454.
Mulhern, John E., Jr.; and Harris, Dwight M., 3,614,343.
Naumann, Robert J.; and Jex, David W., 3,613,794.
Schwarz, Francis C., 3,614,587.

National Science Foundation: *See—*
Knollenberg, Robert G., 3,613,992.

Navy: *See—*
Adrian, Donald J., 3,614,782.
Adrian, Donald J., 3,614,783.
Andrews, Daniel E., Jr.; Klund, William E.; and Isaak, Robert D., 3,614,316.
Bailey, Knight V.; and Hattaway, Dudley P., 3,614,410.
Brandts, Conrad W.; Stemple, Eugene P.; and Frazer, Richard A., 3,614,240.
Brown, William J.; Butler, Robert F.; Hedden, Smith E.; and Jablovskis, Janis, 3,613,592.
Cherkas, Max A., 3,613,617.
De Nobel, Richard W.; Schurman, Donald G.; Lindstadt, Theodore J., Jr.; and Koenig, Hans A., 3,613,619.
Dillard, George M., 3,614,626.
Halpin, Joseph J.; and Wenzel, Richard F., 3,614,435.
Hart, Gerald E., 3,614,348.
Ireland, Ralph H.; and Segrest, Joseph D., 3,614,589.
Isaak, Robert D.; and Littrell, Woodrow H., 3,614,780.
Kaufman, Martin H., 3,613,373.
Kelly, Raymond E.; and Johnson, Edward W., 3,613,626.
Leibowitz, Lawrence M.; and Baldauf, Richard K., 3,614,632.
Lichtman, Samuel W.; and Adrian, Donald J., 3,613,590.
Lichtman, Samuel W., 3,614,781.
Ludlum, Bobby R., 3,614,720.
McCurnin, Thomas W.; and Perper, Lloyd J., 3,613,259.
McKinley, Larry E.; and Evans, William E., 3,613,621.
Nicolai, Van O., 3,614,652.
Pearson, John; McLean, William B.; and Cosner, Lawrence N., 3,613,581.
Redfern, John T., 3,614,592.
Rhyne, William A.; Mc Crory, William W., Jr.; and Mallory, Ray R., 3,613,629.
Talley, James C.; and Potteiger, Lester A., 3,613,586.
Trinite, George M., Jr., 3,614,286.
Whitman, Wesley H., Jr.; and Anderson, Richard D., 3,614,205.
Wolf, Frederick H., 3,614,640.

United States Steel Corporation: *See—*
Roberts, William L., 3,613,425.
Shapland, Earl P., 3,613,965.
Williams, Alvin R., 3,614,374.

United States Surgical Corporation: *See—*
Smith, Forrest P., Jr., 3,613,507.

Universal Harvester Co., Inc.: *See—*
Hubbard, Stephen R., 3,613,346.

Universal Vendors, Inc.: *See—*
Verbeke, Henry, 3,613,947.

University of Maryland, The: *See—*
Hochuli, Urs; and Haldemann, Paul R., 3,614,642.

University of Oklahoma Research Institute, The: *See—*
Sweeney, James W., 3,614,744.

Upton, Lee Oliver, Jr.: *See—*
Farnett, Edward Charles; and Upton, Lee Oliver, Jr.,3,614,400.

Urion, Kenard E.: *See—*
Hill, Rodney S.; Urion, Kenard E.; and Felmann, Frederick W.,3,613,114.

U.S. Expansion Bolt Company: *See—*
Helderman, James F., 3,613,497.

U.S. Philips Corporation: *See—*
Bolger, Bouwe, 3,614,655.
Evrard, Robert, 3,614,512.
Klinkhamer, Jacob Fredrik, 3,614,746.
Kloppenborg, Nico J., 3,614,472.
Le Can, Claude Jan Principe Frederic; and Steinmaier, Walter, 3,614,558.
Meijer, Roelf Jan, 3,613,358.
Meyer, Dietrich, 3,614,598.

Usher, Thomas E., to General Electric Company. Automatic control system for crop shear. 3,614,572, Cl. 318-396.

USM Corporation: *See—*
Pelletier, Raymond T.; and Becker, Karl V., 3,613,138.

Vacher, Fernand L., to Compagnie Generale de Radiologie. X-ray apparatus having cooperating movable cassette carrier and image intensifier pick-up screen. 3,614,427, Cl. 250-65.

Vaiciunas, Alvinas A.: *See—*
Schrader, George F.; and Vaiciunas, Alvinas A.,3,614,618.

Valve Corporation: *See—*
Kuffer, Clarence O., 3,614,062.

Valve Corporation of America: *See—*
Steiman, Wolf, 3,613,728.

Van Auken, John A.; Rush, Christopher; Blank, Fritz A.; Hoffman, Lionel; and Barto, Robert, to Copystatics Manufacturing Corporation. Automatic original feeder for copying machine. 3,614,089, Cl. 271-26.

Van Gaalen, Neil. Fish egg sorting apparatus. 3,613,884, Cl. 209-111.6

Van Kempen, Gerardus Adrianus: *See—*
Platzek, Paul; Van Kempen, Gerardus Adrianus; and Ros, Dominicus,3,614,445.

Van Riemsdijk, Gerardus A., to Smit Nijmegen Electrotechische Fabrieter N. V. Tapchangers for regulating transformers. 3,614,597, Cl. 323-43.5

Vargas, Walter S., to Elmwood Sensors, Inc. Terminal-contact rivet construction and method of assembly thereof. 3,614,702, Cl. 337-381.

Varian Associates: *See—*
Phillips, Robert M., 3,614,516.
Schmidt, Robert C., 3,614,518.
Wilczek, Andrew S., 3,614,515.

Vashon Industries, Inc.: *See—*
Green, Charles J., 3,613,296.

Vaughan & Bushnee Mfg. Co.: *See—*
Wolf, Wayne, 3,613,753.

Vaughan, Roy Cyril, 1/2 to Lamburn, Alan Salisbury. Unidirectional drive element. 3,613,473, Cl. 74-424.5

Vaughn, Julian E.: *See—*
La Pine, Anthony N.; and Vaughn, Julian E.,3,614,635.

Vdolek, Alexander V., to Boeing Company, The. Aircraft combination thrust reverser and sound suppressor and a particular full range balanced thrust reverser. 3,614,037, Cl. 244-110.

Vehvilainen, Mikko: *See—*
Levamaki, Reijo; Vehvilainen, Mikko; and Suhonen, Tapani,3,613,582.

Velednitsky, Ilya Pinkhusovich: *See—*
Mesheingisser, Mikhail Yakovlevich; Ermakov, Ivan Semenovich; Kochkin, Georgy Mikhailovich; Stankun, Alexandr Viktorovich; Shakhov, Filipp Nikolaevich; Velednitsky, Ilya Pinkhusovich; and Yagodin, Petr Petrovich,3,613,563.

Verbeke, Henry, to Universal Vendors, Inc. Pouch vending machine. 3,613,947, Cl. 221-125.

Vercellotti, Leonard C.: *See—*
Thompson, Francis T.; and Vercellotti, Leonard C.,3,614,641.

Vereinigte Flugtechnische Werke Gesellschaft mit beschrankter Haftung fruher 'Weser' Flugzeugbau/ Focke-Wulf/Heinkel-Flugzeugbau:*See—*
Riccius, Rolf; and Weitkamp, Gunter, 3,613,498.

Vergoz, Ronald A., to Holobeam, Inc. Phase-locked pulsed distance measuring equipment utilizing a coarse scale and fine scale measurement. 3,614,226, Cl. 356-5.

Vermes, Roy E., to Revco, Inc. Belt rotary die cutter. 3,613,528, Cl. 93-58.4

Vermette, Howard H. Means for retaining a wound cable on a drum in a taut position and to prevent crisscrossing of the cable winds. 3,614,067, Cl. 254-190.

Vermot, Andre: *See—*
Drevard, Michel; Mognetti, Charles; and Vermot, Andre,3,613,396.

Vernon Tool Company: *See—*
Blackburn, Marvin J.; and Criner, Harry E., 3,614,077.

Verrina S.p.A.: *See—*
Costa, Giuseppe, 3,613,365.

Vetter, Klaus: *See—*
Pilz, Erwin; Vetter, Klaus; and Pankratz, Rudolf,3,613,933.

Vexelman, Garald Lvovich: *See—*
Belopolsky, Anatoly Ovseevich; Evdokimov, Jury Pavlovich; Vexelman, Garald Lvovich; Nikolsky, Gennady Georgievich; and Pchelin, Vitaly Pavlovich,3,613,256.

Vibro-Meter AG: *See—*
Hatschek, Rudolf A., 3,614,487.

Vicon Products Corporation: *See—*
Edelman, Alfred E., 3,614,415.

Victor Company of Japan, Limited: *See—*
Hidaka, Tsuneyoshi; Morita, Akiyoshi; Honjo, Yoshihiko; and Nishimura, Takashi, 3,614,305.

Vilnitis, Aivar Yanovich: *See—*
Folivorov, Vladimir Kikhailovich; Ukraintsev, Boris Nikolaevich; Sirotenko, Georgievich; Tinte, Aivar Eduardovich; Birger, Boris Lvovich; Vilnitis, Aivar Yanovich; Nadezhnikov, Nikita Mikhailovich; and Grinshteen, Mark Ilich,3,614,080.

Vita, Lawrence. Garbage collection system. 3,613,915, Cl. 214-41.

Vitka, Joseph A.; and Murphy, James D., to Motionetics, Inc., mesne. Wave cell. 3,613,264, Cl. 35-19.

Vivian, Weston E.: *See—*
Graham, Robert R.; Siegel, Keeve M.; and Vivian, Weston E.,3,614,778.

Vizzotto, Raffaello, to Falconi, G., & C., S.p.A. Programmed braking for elevators and the like. 3,613,835, Cl. 187-29.

Vockenhuber, Karl: *See—*
Plihal, Hanns; Rothy, Gerhard; and Schild, Josef, 3,613,544.

Vogele, Joseph, AG: *See—*
Hess, Bruno, 3,613,530.

Voige, Louis H.: *See—*
Honeywell, Charles C.; and Voige, Louis H.,3,614,577.

Voith Getriebe KG: *See—*
Dick, Heinrich, 3,614,543.

Volk, Anthony J.: *See—*
Mc Donald, Emery L., 3,613,153.

Volker, Russell E., to General Electric Company. Strut insulator connector. 3,614,292, Cl. 174-45.

Volkmann, John E., to RCA Corporation. Stereophonic sound enhancement system with reverberation chamber. 3,614,320, Cl. 179-1.

Volkswagenwerk Aktiengesellschaft: *See—*
Jager, Heinz, 3,613,156.

Vollmer, David W., to Bausch & Lomb Incorporated. Retardation compensator plate for a polarizing microscope. 3,614,195, Cl. 350-13.

Volz, Robert G. Foot-and-leg walking cast support. 3,613,674, Cl. 128-83.5

Von Duprin, Inc.: *See—*
Zawadzki, George Z., 3,614,145.

Von Fange, Wilbur H.: *See—*
Borrok, Martin J.; Perkinson, Robert E.; Watson, Fred D.; and Von Fange, Wilbur H.,3,614,728.

Voorhees, Steven C.: *See—*
Liberman, Harvey W.; Wade, James A.; and Voorhees, Steven C.,3,613,569.

Voullaire, Izak Johannes. Method of and apparatus for packing batches of sized and/or graded fruit. 3,613,330, Cl. 53-26.

Vyskocil, Charles D.: *See—*
Dunham, Robert W.; and Vyskocil, Charles D.,3,614,697.

Vyzkumny ustav obrabecich stroju a obrabeni: *See—*
Stepanek, Karel, 3,613,439.

Wada, Masuhiro: *See—*
Ishikawa, Shigeji; Terayama, Yuji; and Wada, Masuhiro,3,613,447.

Wade, James A.: *See—*
Liberman, Harvey W.; Wade, James A.; and Voorhees, Steven C.,3,613,569.

Wagener, Paul-Werner: *See—*
Schneider, Felix; Wagener, Paul-Werner; Neuser, Ernst; and Walser, Rudolf,3,613,311.

Waggoner, John B.: *See—*
Schubert, George E.; Swayze, Lloyd D.; and Waggoner, John B.,3,613,818.

Wagner Electric Corporation: *See—*
Bueler, Richard C., 3,614,169.
Olsen, Willy; McKee, John B.; and Pahel, William M., 3,613,229.

Wagner, Hans O., to Schiess Aktiengesellschaft. Vertical boring mill. 3,613,502, Cl. 90-14.

Wagner, Rolf E.: *See—*
Be Vier, William E.; and Wagner, Rolf E.,3,614,631.

Wahlgren, Wallace W.: *See—*
Douglas, Ellwood S.; and Wahlgren, Wallace W.,3,614,533.

Wahlstrom, Sven E., to Shell Oil Company. Single-rail solid state memory with capacitive storage. 3,614,753, Cl. 340-173.

Waite, Fred L. Unscrambling conveyor for baked goods. 3,613,860, Cl. 198-30.

Walchhutter, Ulrico. Apparatus for automatic depositing of glazed tiles in magazines arranged for subsequent firing. 3,613,911, Cl. 214-16.4

Wald Manufacturing Company, Inc.: *See—*
Humlong, Robert F., 3,613,970.

Walde, Erik, to Forsvarets Fabriksverk. Projectile for a muzzle loading rifle-bore mortar. 3,613,596, Cl. 102-94.

Wales, Nathaniel B., Jr., to United States of America, Army. Anti-personnel fragmentation weapon. 3,613,579, Cl. 102-4.

Walker Manufacturing Company: *See—*
Hubbell, Franklin R., III, 3,613,830.

Wallace, Edward M., to Wallace Mfg., Corporation. Shears. 3,613,240, Cl. 30-248.

Wallace, Gersen L., to Clark Equipment Company. Mechanism for controlling the boom arms and bucket of a front end loader. 3,614,273, Cl. 214-778.

Wallace Mfg., Corporation: *See—*
Wallace, Edward M., 3,613,240.

Wallace, Richard R.: *See—*
Grunwald, Robert F.; Wallace, Richard R.; and Bowen, Howard,3,613,444.

Wallace, Richard W.; and Pavlica, Stanley R., to Dresser Industries, Inc. Compaction of particulate matter. 3,613,166, Cl. 18-16.5

Walles, Wilhelm E., to Dow Chemical Company, The. Resinous enclosure members rendered impermeable by sulfonation and neutralization. 3,613,957, Cl. 220-64.

Walls, Edgar H.: *See—*
Heckman, Edward A.; Hinkle, James O.; and Walls, Edgar H.,3,614,601.

Walser, Rudolf: *See—*
Schneider, Felix; Wagener, Paul-Werner; Neuser, Ernst; and Walser, Rudolf,3,613,311.

Walsh, Edward J.: *See—*
Gronros, Warren; and Walsh, Edward J.,3,614,654.

Walton, Richard S., to Hamilton Watch Company. Wrist-watch with liquid crystal display. 3,613,351, Cl. 58-23.

Waltz, Richard W.: *See—*
Ford, David E., Jr.; and Waltz, Richard W.,3,614,596.

Walz, Heinz: *See—*
Klein, Erwin; Koch, Werner; and Walz, Heinz,3,613,308.

Wandinger, Franz: *See—*
Kaufmann, Kurt; Jerney, Rudolf; and Wandinger, Franz,3,614,707.

Wang, James T.: *See—*
Behr, Michael I.; Blessum, Norman S.; and Wang, James T.,3,614,758.

Wanschek, Larry: *See—*
Halinski, Michael J.; and Wanschek, Larry,3,614,522.

Ward, John H., III, to International Telephone and Telegraph Corporation. Optical tracking system utilizing a coaxial lens system. 3,614,449, Cl. 250-203.

Warin, Francis J., to TRW Inc. Combination projectile guide and firing chamber seal. 3,613,500, Cl. 89-26.

Warner & Swasey Company, The: *See—*
Cinadr, Frank A., 3,613,483.

Warner, Richard E.: *See—*
Bray, Warren E., 3,614,380.

Warren Fastener Corporation: *See—*
Meyer, Engelbert A., 3,613,431.

Warren, Francis A.; and Britton, Sylvester C., to North American Rockwell Corporation. Solid propellant grain. 3,613,597, Cl. 102-100.

Watanabe, Kinnosuke: *See—*
Soejima, Tamihiko; Kajiura, Hiroshi; and Watanabe, Kinnosuke,3,613,449.

Watanabe, Yoshiaki: *See—*
Taguchi, Tatsuya; and Watanabe, Yoshiaki,3,613,536.

Watano, Yutaka: *See—*
Fujii, Tatsuo; and Watano, Yutaka,3,614,704.

Watkin, Brian L. H.; Evans, Norman; and Arnold, Ronald J. K., to British Petroleum Company Limited, The. Waveform analyzing system particularly for chromatographs, wherein the waveform is integrated between selected peaks and valleys. 3,614,408, Cl. 235-183.

Watkin, Brian Leslie, to British Petroleum Company Limited, The. Timing device, particularly for chromatographs. 3,614,409, Cl. 235-183.

Watkins, Paula J.: *See—*
Hightower, Russell D.; and Aufill, Charles B.,3,613,455.

Watlow Electric Manufacturing Co.: *See—*
Wrob, Ronald M.; and Kidney, John B., 3,614,387.

Watson, Donald W., to Xerox Corporation. Article processing system with feeder shuttle disconnect. 3,614,088, Cl. 271-4.

Watson, Fred A. Vehicular remote power supply system. 3,614,459, Cl. 307-10.

Watson, Fred D.: *See—*
Borrok, Martin J.; Perkinson, Robert E.; Watson, Fred D.; and Von Fange, Wilbur H.,3,614,728.

Watson, William J.; and Kastner, William D., to Texas Instruments, Incorporated. Automatic context switching in a multi- programmed multi-processor system. 3,614,742, Cl. 340-172.5

Watts, Ridley Jr., to American Packaging Corporation, The. Impulse heating device for use with thermoplastic materials and method. 3,614,383, Cl. 219-243.

Wearden, Charles G.: *See—*
Swander, Kenneth D., Jr.; and Wearden, Charles G.,3,613,515.

Webb, Richard H.: *See—*
Jubb, Albert; Hutchinson, Stanley; and Webb, Richard H.,3,613,363.

Weber, Emil W. Cutting tool assembly. 3,613,198, Cl. 29-96.

Weber, Heinz, to Bremshey & Co. Umbrella having a flat cross-sectional shape in closed condition thereof. 3,613,702, Cl. 135-20.

Weber, Marvin J.: *See—*
Monchamp, Roch R.; Weber, Marvin J.; and Bass, Michael,3,614,662.

Wedin, Kurt, to Allmanna Svenska Elektriska Aktiebolaget. Central power plant for feeding DC power transmission plant. 3,614,585, Cl. 321-2.

Wegner Electric Corporation: *See—*
Machek, John A., 3,614,171.

Wehren, Harold J. Spinning bobber. 3,613,289, Cl. 43-43.11

Wehrli, Pierre: *See—*
Koulicovitch, Maurice; Pettavel, Jacques; and Wehrli, Pierre,3,614,454.

Weichel, Ernst. Self-loading vehicle for agricultural bulk materials. 3,613,344, Cl. 56-364.

Weidenhamer, Jerald H.: *See—*
United States of America,National Aeronautics and Space Administration, Administrator, 3,613,457.

Weigert, Wilhelm: *See—*
Flaschar, Heinz; Weigert, Wilhelm; Werner, Walter; and Kramer, Manfred,3,613,509.

Weinhart, Maurice. Safety bed rails. 3,613,132, Cl. 5-238.

Weir, Stanley M., to FMC Corporation. Warehouse system with infeed and distributing conveyors serving stacker cranes in a common aisle. 3,613,910, Cl. 214-16.4

Weitkamp, Gunter: *See—*
Riccius, Rolf; and Weitkamp, Gunter,3,613,498.

Welch, Elmer Scott, to G & H Products, Inc. Check valve assembly. 3,613,720, Cl. 137-527.8

Weller, Carroll E.; and McNair, Robert J., to Avco Corporation. Voltage controlled oscillator with digital preset. 3,614,665, Cl. 331-101.

Wellford, Walker L., Jr., to Moore Dry Kiln Company of Oregon. Direct-fired kiln furnace control system. 3,614,074, Cl. 263-40.

Welsch, Hans-Juergen: *See—*
Lingg, Gerhard; and Welsch, Hans-Juergen,3,613,864.

Wendelburg, Robert W.: *See—*
Stearns, James B.; and Wendelburg, Robert W.,3,614,377.
Wendland, Broder. Distortion correction circuit for linearly distorted pulse sequences. 3,614,636, Cl. 328-162.
Wendt, Oscar E. Whirlpool Corporation Ice marker apparatus. 3,613,388, Cl. 62-130.
Wenger, Charles B.: *See—*
Tosch, William C.; and Wenger, Charles B.,3,613,787.
Wenzel, Richard F.: *See—*
Halpin, Joseph J.; and Wenzel, Richard F.,3,614,435.
Werkmeister, Johannes; and Scheler, Holger, to Traub Vertriebsgesellschaft mbH., Firma. Feeding apparatus for rod stock for a machine tool. 3,613,487, Cl. 82-2.7
Werner, Walter: *See—*
Flaschar, Heinz; Weigert, Wilhelm; Werner, Walter; and Kramer, Manfred,3,613,509.
Werr, Winfried: *See—*
Topfer, Herbert; and Werr, Winfried,3,614,329.
Werth, Lawrence A.; and De Remo, David W. Filter cleaning apparatus. 3,613,700, Cl. 134-57.
Wesselmann, Heinz, to Windmoller & Holscher. Machine for making and applying U-shaped carrying handles consisting of strips of paper or the like. 3,613,523, Cl. 93-8.
West Construction Enterprises, Inc.: *See—*
Dickinson, Bryan J., 3,613,382.
West, Emery C., 1/3 to Smith, Harold W., and 1/3 to Churchin, Elinore. Adjustable cutter for hooked rug materials. 3,613,238, Cl. 30-136.
Westberg, Bertil. Apparatus for mounting venetian blind slats. 3,613,193, Cl. 29-24.5
Westcott, Robert F., to International Paper Company. Vented package. 3,613,938, Cl. 220-44.
Westendorp, Willem F.: *See—*
Smith, Sidney R., Jr.; and Westendorp, Willem F.,3,614,532.
Westerberg, Eugene R.: *See—*
Heynick, Louis N.; and Westerberg, Eugene R.,3,614,423.
Western Electric Company, Incorporated: *See—*
Dinella, Donald; and Schutz, Eckert Franz, 3,614,225.
Fisher, Everett H., 3,613,219.
Heckman, Edward A.; Hinkle, James O.; and Walls, Edgar H., 3,614,601.
Martin, Allen N.; and Speas, John L., 3,614,603.
Porter, David Lee, 3,614,683.
Starliper, Ronald L., 3,614,614.
Western Gear Corporation: *See—*
Schwarzbeck, John G., 3,613,852.
Westhoff, Heinz: *See—*
Hermes, Heinz; Hinterthur, Helmut; Otto, Arnold; Thieme, Klaus Dietrich; and Westhoff, Heinz,3,614,723.
Westinghouse Air Brake Company: *See—*
Grundy, Reed H., 3,614,466.
Sarbach, Ronald A., 3,613,459.
Westinghouse Brake and Signal Company Limited: *See—*
David, Vivian, 3,614,620.
King, Kenneth G., 3,614,586.
Westinghouse Electric Corporation: *See—*
Brenner, William C., 3,614,497.
Ellsworth, James P.; and Flick, Robert H., 3,614,685.
Evans, George S., 3,614,506.
Heitchue, Regis D., Sr., 3,614,384.
Huchok, Arthur A., 3,614,366.
Jones, Charles H., 3,614,722.
Kernick, Andress, 3,614,590.
Klem, Franklin D., 3,613,946.
Miller, Bernard; and Mc Closkey, Joseph C., 3,614,428.
Polgar, Emerick T., 3,613,614.
Rosa, John, 3,614,594.
Scheffler, Paul H.; and McCabria, Jack L., 3,614,258.
Silva, Antonio V., 3,613,419.
Thompson, Francis T.; and Vercellotti, Leonard C., 3,614,641.
Tobin, Joseph M.; Tauson, Peter O.; Fleischer, Leonard R.; and Ebner, Harry F., 3,613,655.
Willson, Robert H., 3,614,509.
Witteman, Wilhelmus Jacobus; and Zalm, Pieter, 3,614,507.
Westman, Erik: *See—*
Landa, Torstein; Syvakari, Perti; and Westman, Erik,3,613,157.
Weston, Donald E., to Allis-Chalmers Manufacturing Company. Contact with low-cathode drop material insert. 3,614,361, Cl. 200-166.
Westvaco Corporation: *See—*
Goodsite, James R., 3,613,985.
Wetherell, Richard B., Jr., to Monsanto Company. Compartmentalized container package. 3,613,955, Cl. 222-83.
Wetherill, John H., to Hennessy Products, Incorporated. Journal box cleaning tool. 3,613,144, Cl. 15-210.
Wetter, Jakob: *See—*
Schenk, Horst; Wetter, Jakob; and Guse, Rudolf,3,613,432.
Wheatley, Carl Franklin, Jr., to RCA Corporation. Differential amplifier. 3,614,645, Cl. 330-30.
Wheatley, Charles, Company: *See—*
Fitzpatrick, John R., 3,614,061.
Whirlpool Corporation: *See—*
Bottas, Michael J.; MacFarlane, Thomas R.; and Miller, Frank E., 3,613,560.
Bottas, Michael J.; Difley, Charles R.; and Miller, Frank E., 3,613,568.
Cuthbert, Victor W., 3,614,187.
Difley, Charles R., 3,613,561.
Mason, Anthony, 3,613,959.
Ohlsson, Leonard W.; and Sitko, Robert H., 3,613,389.
White, Albert H.: *See—*
Kampe, Robert F.; and White, Albert H.,3,613,708.
White Consolidated Industries, Inc.: *See—*
Harter, Donald G., 3,613,391.
White, David Lynn: *See—*
Dent, Calvin J., 3,614,136.
Whitecar, Alten E., to Smith Kline & French Laboratories. Capsule orienting machine. 3,613,861, Cl. 198-33.
Whiteman, Max: *See—*
Seguin, Ernest; and Whiteman, Max,3,613,300.
Whitesides, Jack C.: *See—*
Whitfield, Carroll J.; and Whitesides, Jack C.,3,613,797.
Whitfield, Carroll J.; and Whitesides, Jack C., to Kelley Manufacturing Company. Peanut digger, shaker and inverter. 3,613,797, Cl. 171-61.
Whitlock, Robert A., to Aqua Matic, Inc. Multiport valve. 3,613,731, Cl. 137-625.29
Whitman, Wesley H., Jr.; and Anderson, Richard D., to United States of America, Navy. Two channel optical transmitter. 3,614,205, Cl. 350-171.
Whitney, W. A., Corporation: *See—*
Conn, Harry; Mauk, Robert W.; and Lancaster, Paul M., 3,613,493.
Whittaker, William, to C.C.L. Systems Limited. Cable or rod anchoring means. 3,613,179, Cl. 24-123.
Wick, Gerald H.; and Holtermann, Theodore J., to Outboard Marine Corporation. Outboard motor isolation system. 3,613,631, Cl. 115-17.
Wieltsch, Horst: *See—*
Meissner, Willi; and Wieltsch, Horst,3,613,148.
Wierzbowski, Daniel A.: *See—*
Perkins, Earl Stuart; and Wierzbowski, Daniel A.,3,613,247.
Wiese, Richard V., to Graco Inc. Pressure control assembly with two switch housings and an open space between the pressure source and contacts. 3,614,352, Cl. 200-82.
Wiessner, Willi; and Mann, Georg, to Leitz, Ernst, G.m.b.H. Photographic camera having electric motor drive. 3,613,542, Cl. 95-31.
Wikdahl, Nils Anders Lennart. Clyclone separator to be built-in a casing or similar. 3,613,887, Cl. 209-211.
Wilczek, Andrew S., to Varian Associates. Crossed-field reentrant stream tubes having an improved drift space geometry. 3,614,515, Cl. 315-3.5
Wildhaber, Ernest. Ray-typewriter. 3,613,532, Cl. 95-4.5
Wilfinger, Raymond J., to International Business Machines Corporation. Electromechanical monolithic resonator. 3,614,677, Cl. 333-71.
Wilke, Raud A., to Koehring Company. Fluid motor control mechanism. 3,613,711, Cl. 137-115.
Wilkes, John D. Releasable ski bindings and accessories. 3,614,119, Cl. 280-11.35
Wilkinson, Judkins E., to Atlanta Stove Works, Inc. Andiron. 3,613,660, Cl. 126-298.
Willey, Sally M. Heel stiffeners. 3,613,274, Cl. 36-68.
Williams, Alvin R., to United States Steel Corporation. Method of producing a welded joint. 3,614,374, Cl. 219-91.
Williams, Chester I. Method for securing forms from a position of safety. 3,613,216, Cl. 29-428.
Williams, Clarence E., to Justrite Mfg., Co. Safety cleaning tanks. 3,613,942, Cl. 220-88.
Williams, Ralph J.: *See—*
Stram, George H.; Williams, Ralph J.; Altland, George E.; and Dunn, Thomas J.,3,613,131.
Williamson, Dennis F.: *See—*
Speer, Gordon W.; and Williamson, Dennis F.,3,614,461.
Williamson, Samuel R.: *See—*
Pinnow, Douglas A.; and Williamson, Samuel R.,3,614,204.
Williamson, T. D., Inc.: *See—*
Rose, Dillard L.; and Osburn, Coy D., 3,614,252.
Wills, Leonard Atlee. Sanitary sipping-straw dispenser. 3,613,948, Cl. 221-250.
Willson, James K. V.; and Eskridge, Marshall. Controllable tip brush for medical use. 3,613,664, Cl. 128-2.
Willson, James R.; Krueger, Keith T.; Tyler, Hugh J.; and Jackson, Wilbur F., to Robertshaw Controls Company. Temperature responsive valve operators. 3,613,732, Cl. 137-625.44
Willson, Robert H., to Westinghouse Electric Corporation. Large area plasma panel display device. 3,614,509, Cl. 313-201.
Wilshusen, Albert R. Grain separator for combines. 3,613,691, Cl. 130-23.
Wilska, John E.; Felix, Harold F.; Dialessi, John A.; and Emerson, Fred C. Outdoor cooker with re-usable cartridge type grill unit. 3,613,657, Cl. 126-41.
Wilson, Archie: *See—*
Slator, Damon T.; and Wilson, Archie,3,614,019.
Wilson, Floyd A., to Anaconda Wire and Cable Company. Power cable with polypropylene covered ground check strand. 3,614,300, Cl. 174-115.

Wilson, John F.: *See—*
Magee, Kenneth L.; and Wilson, John F.,3,614,177.
Wilson, Richard G., to United States of America, Atomic Energy Commission. Switchable microwave circulator wherein ground planes are comprised of foils having electrically conductive particles. 3,614,670, Cl. 333-1.1
Wilson, Robert: *See—*
Dunlap, Henry F.; and Wilson, Robert,3,613,378.
Wilson, William P., Sr.: *See—*
Hopfe, Dieter H.; and Wilson, William P., Sr.,3,613,456.
Windmoller & Holscher: *See—*
Stork, Willi; and Haupt, Karl, 3,613,529.
Wesselmann, Heinz, 3,613,523.
Winn, William C.: *See—*
Pierce, Stanley L.; and Winn, William C.,3,613,484.
Wirtz, John S., to Itek Corporation. Fluorescent lamp dimming circuit. 3,614,527, Cl. 315-199.
Wisconsin Electrical Mfg., Co., Inc.: *See—*
Probert, Walter L.; and Finch, Steven R., 3,614,397.
Witek, Roman J., Jr.: *See—*
Taormina, Anthony J.; and Witek, Roman J., Jr.,3,614,712.
Withington, Clinton E. Non-repeat control apparatus for power machinery. 3,613,357, Cl. 60-10.5
Witkowski, Leonard J.: *See—*
Jope, Bruce T.; and Witkowski, Leonard J.,3,613,979.
Witt, Max E. Chlorine injection means. 3,613,723, Cl. 137-604.
Witt, Max E. Chlorination control apparatus. 3,614,263, Cl. 417-7.
Witteman, Wilhelmus Jacobus; and Zalm, Pieter, to Westinghouse Electric Corporation. Device for producing stimulated infrared emission, iraser, by means of an electric discharge in a gas mixture consisting partly of carbonic acid gas, and discharge tube destined for such a device. 3,614,507, Cl. 313-174.
Witzig, Emil Karl; and Frank, Rudolf. Multi-spindle cutting machine to produce holes in sheet metal, for example sieve structures. 3,614,251, Cl. 408-3.
Witzig, Werner, to Sonoco Products Company. Convolutely wound tube having readily conformable inside edge portion and method for making same. 3,613,738, Cl. 138-156.
Wojcik, Robert J., to Pettibone Corporation. Pressure control system for a grinding machine and actuating unit therefor. 3,614,351, Cl. 200-61.86
Wolak, Norbert S.; Wolak, Thomas J.; and Ceyer, Alfons W., to Evans Products Company. Railway car plug door structure. 3,613,312, Cl. 49-220.
Wolak, Thomas J.: *See—*
Wolak, Norbert S.; Wolak, Thomas J.; and Ceyer, Alfons W.,3,613,312.
Woletz, Robert M.: *See—*
Singer, M Leonard; and Woletz, Robert M.,3,613,415.
Wolf, Frederick H., to United States of America, Navy. Frequency discriminator using no inductive components. 3,614,640, Cl. 329-110.
Wolf, Lloyd J. Tandem axle suspensions. 3,614,121, Cl. 280-104.5
Wolf, Wayne, to Vaughan & Bushnee Mfg. Co. Hollow hammer handle with longitudinally tensioned glass fibers. 3,613,753, Cl. 145-61.
Wolfram, Karl-Heinz: *See—*
Muth, Gregor Nikolaus; and Wolfram, Karl-Heinz,3,613,576.
Wood, Fred M., to Pyles Industries, Inc. Ratio linkage assembly. 3,613,465, Cl. 74-110.
Wood, Lowell L., Jr.: *See—*
Jensen, Carl A.; and Wood, Lowell L., Jr.,3,614,489.
Woodburn, Wilton A., to Aluminum Company of America. Procedure for controlling a multistand rolling mill. 3,613,417, Cl. 72-8.
Woodhead, James; Hedley, David Alan; and Jardine, Maurice Revie, to Roneo Limited. Print selection and paper feed adjusting means in postal franking machines. 3,613,573, Cl. 101-92.
Woodward, Benjamin W.; and Allard, John J., to Sperry Rand Corporation. Closed loop, on-off control system for D.C. motors including dynamic braking. 3,614,578, Cl. 318-673.
Woodward, Heber Jay, to Index Industries, Inc. Auxiliary braking system. 3,613,356, Cl. 60-6.
Wool Industries Research Association: *See—*
Medley, John A., 3,614,369.
Woolslayer, Homer J.; Woolslayer, Joseph R.; Jenkins, Cecil; and Campbell, Erwin A., to Moore, Lee C., Corporation. Method and apparatus for handling drill pipe. 3,613,905, Cl. 214-2.5
Woolslayer, Joseph R.: *See—*
Woolslayer, Homer J.; Woolslayer, Joseph R.; Jenkins, Cecil; and Campbell, Erwin A.,3,613,905.
Worden, Donald A., to Morotta Scientific Controls, Inc. Throttle control valve assembly. 3,613,520, Cl. 92-133.
Wright, Colin S.; Fogelsong, Robert E.; Johnson, Jerold W.; and Jouhal, Teja S., to American Hoist & Derrick Company. Apparatus for horizontal baling. 3,613,556, Cl. 100-14.
Wrob, Ronald M.; and Kidney, John B., to Watlow Electric Manufacturing Co. Electrical heater with an internal thermocouple. 3,614,387, Cl. 219-328.
Wynne, John Roger: *See—*
Smith, Charles Philip; and Wynne, John Roger,3,613,367.
Xerox Corporation: *See—*
Daughton, John W.; Donohue, James M.; and Schluntz, Gary L., 3,614,419.
Del Vecchio, George D.; Schwartz, Edward A.; and Yarger, Norman L., 3,614,090.
Shah, Dinesh S.; and Gardner, John F., 3,613,637.
Solarek, Thomas W., 3,613,638.
Solarek, Thomas W., 3,614,221.
Soures, Nicholas M., 3,613,636.
Watson, Donald W., 3,614,088.
Yagodin, Petr Petrovich: *See—*
Mesheingisser, Mikhail Yakovlevich; Ermakov, Ivan Semenovich; Kochkin, Georgy Mikhailovich; Stankun, Alexandr Viktorovich; Shakhov, Filipp Nikolaevich; Velednitsky, Ilya Pinkhusovich; and Yagodin, Petr Petrovich,3,613,563.
Yalyshev, Aly Umyarocivh; Svecharnik, David Veniaminovich; Pavlenko, Vladimir Alexandrovich; Tsarkov, Vyacheslav Alexeevich; Bonch-Bruevich, Andrei Mikhailovich; and Levinson, Boris Alexandrovich, to Gosudarstvenny nauchno-issledovatelsky institut oteploenergeticheskogo priborostroenia. Industrial process regulator of proportional plus integral differential action. 3,614,633, Cl. 328-127.
Yamabe, Masahiro: *See—*
Matsui, Masao; and Yamabe, Masahiro,3,613,173.
Yamaguchi, Hiroji: *See—*
Asano, Tadao; Yamaguchi, Hiroji; and Ishikawa, Kazuo,3,613,844.
Yamaguchi, Kenichi, to Nagatoshi Suzuki. Steering column lock. 3,613,412, Cl. 70-252.
Yamaguchi, Tamio, to Tokyo Gas Company Limited. Ignition and flame detection system utilizing a single electrode. 3,614,280, Cl. 431-25.
Yamaha Hatsudoki KabushikiKaisha: *See—*
Takada, Norio, 3,613,205.
Yamamoto, Katsuro, to Bridgestone Liquefied Gas Company. Low-temperature liquefied gas storage equipment. 3,613,932, Cl. 220-9.
Yamamoto, Kozo; and Naito, Morihisa, to Matsushita Electric Industrial Co., Ltd. Magnetic tape recorder of magazine type. 3,614,109, Cl. 274-4.
Yamamoto, Taro: *See—*
Shimokusu, Kazuo; Korekawa, Takashi; Hosokawa, Tomoyuki; Yamamoto, Taro; and Kobayasi, Takao,3,613,405.
Yannuzzi, Anthony. Prone position alarm. 3,614,763, Cl. 340-279.
Yarger, Norman L.: *See—*
Del Vecchio, George D.; Schwartz, Edward A.; and Yarger, Norman L.,3,614,090.
Yarushkin, Jury Pavlovich: *See—*
Ananiev, Lev Martemianovich; Pekker, Yakov Semenovich; Chakhlov, Vladimir Lukianovich; Sharachin, Yakov Afanasievich; Shtein, Mikhail Mikhailovich; and Yarushkin, Jury Pavlovich,3,614,638.
Yashiike, Chikas; Tsuru, Hideyuki; and Yoshiike, Yoichi. Hair dryer. 3,613,257, Cl. 34-91.
Yatsushiro, Kenji; and Kuchuris, George F., to Controls Company of America. Bi-directional motor. 3,614,492, Cl. 310-41.
Yawata, Yasuro; and Nakae, Nobuhiro, to Matsushita Electric Industrial Co., Ltd. Record player. 3,614,184, Cl. 312-8.
Yazaki, Mutsunobu; and Uchiyama, Takashi, to Canon Kabushiki Kaisha. Flash guide number setting device for camera. 3,613,534, Cl. 95-10.
Yee, Alfred Alphonse. Concrete construction. 3,613,325, Cl. 52-236.
Yoe Leaf Tobacco Co.: *See—*
Paules, Eugene H., 3,613,953.
Yokohama, Kato: *See—*
Fukatsu, Akihiro; and Yokohama, Kato,3,614,505.
Yoshiike, Yoichi: *See—*
Yashiike, Chikas; Tsuru, Hideyuki; and Yoshiike, Yoichi,3,613,257.
Yoshimatsu, Mitsuru, to Rigaku Denki Co., Ltd. X-ray diffraction apparatus comprising a curved spectroscopic crystal with a rotatable X-ray slit at the focus thereof. 3,614,425, Cl. 250-51.5
Yoshio, Toshihiko, to Tokyo Shibaura Electric Co., Ltd. Switching device having electro- magnetic means for increasing effective contact pressure. 3,614,353, Cl. 200-144.
Young, George B. A., to Rapid Metal Development Limited. Arrangements for use in the supporting of formwork for the casting of concrete slabs. 3,614,048, Cl. 249-18.
Young, Patrick J.: *See—*
Keller, Harold; and Young, Patrick J.,3,613,859.
Yuen Sang Hardware Co., Ltd.: *See—*
Poon, Yuen Sang, 3,613,183.
Zalm, Pieter: *See—*
Witteman, Wilhelmus Jacobus; and Zalm, Pieter,3,614,507.
Zamarra, Paul A. Disposable bag with pocket for soluble substance. 3,613,680, Cl. 128-224.
Zaugg, Ramon Earl. Multi-chamber floating barrier. 3,613,377, Cl. 61-1.
Zawadzki, George Z., to Von Duprin, Inc. Dogging device for panic exit latch and actuator assembly. 3,614,145, Cl. 292-92.
Zdarsky, Eduard. Mouth mirror. 3,613,246, Cl. 32-69.
Zeigler, Philip B.; St. Amand, James C.; and Ranft, Ernst L., to General Motors Corporation. Sensor and fragmentizable glass means for releasing a penetrator. 3,613,944, Cl. 222-5.
Zeiss, Carl: *See—*
Basista, Heinrich, 3,614,207.
Zeiss-Stiftung, Carl: *See—*
Basista, Heinrich, 3,614,207.
Zenith Radio Corporation: *See—*
Dietch, Leonard, 3,614,503.
Figlewicz, Raymond C.; and Rennick, John L., 3,614,519.

Kaplan, Sam H., 3,614,504.
Korpel, Adrianus, 3,614,310.
Zerand Corporation: *See*—
Zernov, Peter; and Swansen, Raymond, Jr., 3,614,087.
Zernov, Peter; and Swansen, Raymond, Jr., to Zerand Corporation. Carton blank handling apparatus. 3,614,087, Cl. 270-60.
Ziegler, William E., to Hoover Ball and Bearing Company. Drive assembly for a reciprocating screw extruder. 3,613,169, Cl. 18-30.
Ziller, Fritz, to Alfa-Laval Bergedorfer Eisenwerke G.m.b.H. Stroke control for the push bottom of a push centrifuge. 3,613,892, Cl. 210-374.
Zimmet, Arthur L.,: *See*—
Zimmet, Arthur L.; and Chernack, Milton P., 3,614,760.
Zimmet, Arthur L.; and Chernack, Milton P., 1/3 each to Zimmet, Arthur L., Chermack, Milton P., and Trachtenberg, Murray S. Signaling apparatus. 3,614,760, Cl. 340-224.
Zoerb, Edward G., to Honeywell Inc. Control apparatus. 3,613,452, Cl. 73-339.
Zollo, Corrado: *See*—
Kohler, John C.; Sutliff, Robert C.; and Zollo, Corrado,3,613,876.
Zouhar, Drahomir: *See*—
Havranek, Milan; Zouhar, Drahomir; and Javorek, Jaroslav,3,613,400.
Zuch, Howard W.: *See*—
Jones, James J.; Oxford, David B.; and Zuch, Howard W.,3,614,634.
Zummo, Ennio: *See*—
Bruschetti, Sergio; and Zummo, Ennio,3,613,780.
Zyrotron Industries, Inc.: *See*—
Quinn, Frederic R., 3,614,345.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 19TH DAY OF OCTOBER, 1971

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Cutler-Hammer, Inc. : *See*—
Risberg, Robert L. Re. 27,193.

DeCorso, Serafino M., and C. B. Wolf, to Westinghouse Electric Corp. Nonconsumable electrode. Re. 27,196, 10–19–71. Cl. 13—18.

Flanagen, Robert L., to WDS, Inc. Mobile vehicle press. Re. 27,194, 10–19–71. Cl. 100—100.

Gogarty, William B., to Marathon Oil Co. Processes for the simultaneous displacement of petroleum and water in formations. Re. 27,198, 10–19–71. Cl. 166—252.

Gogarty, William B., and H. P. Meabon, to Marathon Oil Co. Processes for the simultaneous displacement of petroleum and water in formations. Re. 27,199, 10–19–71. Cl. 166—252.

Klug, Herbert H., to The Magnavox Co. Magnetically coupled core and coil having relative movement. Re. 27,195, 10–19–71. Cl. 336—130.

Luvals, Inc. : *See*—
Shields, James L. Re. 27,197.

Magnavox Co., The : *See*—
Klug, Herbert H. Re. 27,195.

Marathon Oil Co. : *See*—
Gogarty, William B. Re. 27,198.
Gogarty, William B., and Meabon. Re. 27,199.

Meabon, Harold P. : *See*—
Gogarty, William B., and Meabon. Re. 27,199.

Miles Laboratories, Inc. : *See*—
Porcaro, Louis F. Re. 27,190.

Milewski, Victor, to The Valeron Corp. Fine pitch milling cutter improvement. Re. 27,192, 10–19–71, Cl. 29—105.

Porcaro, Louis F., to Miles Laboratories, Inc. Method and apparatus for orienting pad-like articles. Re. 27,190, 10–19–71, Cl. 198—24.

Risberg, Robert L., to Cutler-Hammer, Inc. Electronic inverters with separate source for precharging commutating capacitors. Re. 27,193, 10–19–71, Cl. 321—44.

Shields, James L., to Luvals, Inc. Ignition system. Re. 27,197, 10–19–71, Cl. 123—148.

Skrob, Frank J., deceased, to Skrob, Inc. Rotary piston device. Re. 27,191, 10–19–71, Cl. 123—8.07.

Skrob, Inc. : *See*—
Skrob, Frank J. Re. 27,191.

Valeron Corp., The : *See*—
Milewski, Victor. Re. 27,192.

WDS, Inc. : *See*—
Flanagen, Robert L. Re. 27,194.

Westinghouse Electric Corp. : *See*—
DeCorso, Serafino, and Wolf. Re. 27,196.

Wolf, Charles B. : *See*—
DeCorso, Serafino M., and Wolf. Re. 27,196.

LIST OF DESIGN PATENTEES

Ahrens, Claud W. Farrowing house. 222,365, 10–19–71, Cl. D30—1.

Ajax Enterprise Corp. : *See*—
Berger, Samuel H. 222,366.

American Caudeceus Industries, Inc. : *See*—
Burnhill, Michael S. 222,402.

American Seating Co. : *See*—
Sundberg, Carl W., Ferar, and Barecki. 222,350.

Baldwin, D. H., Co. : *See*—
Kimble, Thomas E. 222,393.
White, Winsor D. 222,394.
White, Winsor D. 222,395.

Barecki, Chester J. : *See*—
Sundberg, Carl W., Ferar, and Barecki. 222,350.

Barnes, Gary Joe : *See*—
Harrison, Benjamin F., Jr., and Barnes. 222,326.
Harrison, Benjamin F., Jr., and Barnes. 222,327.

Barnes, Jack G. Desk tray for a rubber stamp sign kit. 222,400, 10–19–71, Cl. D74—5.

Beaver, Ted L., to Continental Can Co., Inc. Jug or similar article. 222,335, 10–19–71, Cl. D9—47.

Bencik, Lajos. Drinking vessel or the like. 222,375, 10–19–71, Cl. D36—8.

Berger, Samuel H., to Ajax Enterprise Corp. Billiard cue rack. 222,366, 10–19–71, Cl. D33—3.

Berkoff, Daniel A., to Hollywood Accessories (a division of Orion Industries Inc.). Clock. 222,378, 10–19–71, Cl. D42—7.

Brown, Laureston C. : *See*—
Ferro, Patrick V., and Brown. 222,352.

Bullard, Clifton. Decorative hanging including skeletal framework. 222,363, 10–19–71, Cl. D29—1.

Burnhill, Michael S., to American Caudeceus Industries, Inc. Sterile package. 222,402, 10–19–71, Cl. D83—1.

Burton, Benjamin E., to Electro Engineering Products Co., Inc. Combined electric shaver and head protecting cap therefor. 222,422, 10–19–71, Cl. D95—3.

Burwell, Neil W. : *See*—
Di Meo, Franklin R. 222,358.

Burwell, Shirley D. : *See*—
Di Meo, Franklin R. 222,358.

Cannon Mills Co. : *See*—
Clementi, Leonard C. 222,410.
Clementi, Leonard C. 222,416.
Haney, Joyce E. 222,418.
Rock, John W. 222,411.
Rock, John W. 222,412.
Rock, John W. 222,417.
Rock, John W. 222,419.
Rock, John W. 222,420.
Scherer, Nancy A. 222,413.
Scherer, Nancy A. 222,414.
Scherer, Nancy A. 222,415.

Carmellini, Andrew E. : *See*—
Ottinger, Lester V., James, and Carmellini. 222,344.

Cathey, Juil William, Jr. Warning sign. 222,397, 10–19–71, Cl. D72—1.

Chance, A. B., Co. : *See*—
Lewis, Paul E., and Harmon. 222,334.

Chreist, Louis R., Jr., to South Bend Toy Mfg. Co. Wicket. 222,371, 10–19–71, Cl. D34—5.

Clementi, Leonard C., to Cannon Mills Co. Textile fabric. 222,410, 10–19–71, Cl. D92—1.

Clementi, Leonard C., to Cannon Mills Co. Textile fabric. 222,416, 10–19–71, Cl. D92—1.

Continental Can Co., Inc. : *See*—
Beaver, Ted L. 222,335.

Coulter Diagnostics, Inc. : *See*—
Feuer, Perry. 222,401.

Cousins, Michael A., to Justus Koe & Sons, Inc. Tape measure. 222,384, 10–19–71, Cl. D52—1.

Crary, Ely J. Eye surgical tool. 222,403, 10–19–71, Cl. D83—12.

Creative Creations, Inc. : *See*—
Feuer, Perry. 222,401.

Crossland, Edward J. : *See*—
Laws, Ira G., and Crossland. 222,399.

Current, Wayne A., to The Singer Co. Electric scissors. 222,332, 10–19–71, Cl. D8—61.

Curtis, Howard S. Clown bed. 222,325, 10–19–71, Cl. D5—4.

Cusovitch, John F. Carpet tool. 222,329, 10–19–71, Cl. D8—15.

De Fee, Alton W. Handle stick for a frozen confection. 222,323, 10–19–71, Cl. D1—99.

Desprez, Jean M. L., to Parfums Jean Desprez, Societe Anonyme of France. Bottle. 222,338, 10–19–71, Cl. D9—115.

Dickstein, Leonard, and B. Green. Motion picture film splicer. 222,396, 10–19–71, Cl. D61—1.

Di Meo, Franklin R., and N. W. Burwell, deceased, by S. D. Burwell, legal representative, to RCA Corp. Antenna. 222,358, 10–19–71, Cl. D26—14.

Electro Engineering Products Co., Inc. : *See*—
Burton, Benjamin E. 222,422.

Emerson Electric Co. : *See*—
Freese, Charles E. 222,382.

Evans-Aristocrat Industries, Inc. : *See*—
Wolf, Murray. 222,404.

Farris, Richard W. Deodorizer or the like. 222,355, 10–19–71, Cl. D23—150.

Ferar, Montgomery : *See*—
Sundberg, Carl W., Ferar, and Barecki. 222,350.

Ferro, Patrick V., and L. C. Brown, to Coulter Diagnostics, Inc. Disposable vial for blood cell counting. 222,352, 10–19–71, Cl. D16—1.

Fell, Ferol S., W. D. Long, and K. R. McMillen, to Hesston Corp. Forage harvester header. 222,377, 10–19–71, Cl. D40—1.

Feuer, Perry, to Creative Creations, Inc. Pencil. 222,401, 10–19–71, Cl. D74—24.

Feuerer, William A. Piton. 222,333, 10–19–71, Cl. D8—230.

Foltz, Charles J., and B. J. Tomonelli. Flat roof drain. 222,354, 10–19–71, Cl. D23—42.

Fontaine, Raymond C., to Textron Inc. Linkage for an identification bracelet or similar article. 222,381, 10–19–71, Cl. D45—4.

Fornataro, Orlando B. Bicycle wheel ornamental cover. 222,347, 10–19–71, Cl. D14—30.

Fraioli, Joseph, Sr. Pizza pie cutter. 222,380, 10–19–71, Cl. D44—29.
Franklin, Robert P.: *See*—
Koch, Walter L., Franklin, and Huyler. 222,385.
Koch, Walter L., Franklin, and Huyler. 222,389.
Freese, Charles E., to Emerson Electric Co. Sewer cleaner housing. 222,382, 10–19–71, Cl. D49—10.
General Crafts Corp.: *See*—
Krifchin, Benjamin. 222,406.
General Electric Co.: *See*—
Maliskas, John S. 222,360.
Glisson, James T., to Motivation Systems, Inc. Mobile kindergarten facility. 222,342, 10–19–71, Cl. D13—1.
Goss, Robert C. Paper bag holder. 222,367, 10–19–71, Cl. D33—3.
Green, Barry: *See*—
Dickstein, Leonard, and Green. 222,396.
Hamilton Cosco, Inc.: *See*—
Schroer, Charles E., and Hamilton. 222,369.
Hamilton, John J.: *See*—
Schroer, Charles E., and Hamilton. 222,369.
Haney, Joyce E., to Cannon Mills Co. Towel or similar article. 222,418, 10–19–71, Cl. D92—26.
Harmon, Robert W.: *See*—
Lewis, Paul E., and Harmon. 222,334.
Harrison, Benjamin F., Jr., and G. J. Barnes, to Lorch, Inc. Combined upending bed and desk or similar article. 222,326, 10–19–71, Cl. D5—4.
Harrison, Benjamin F., Jr., and G. J. Barnes, to Lorch, Inc. Combined upending bed and desk or similar article. 222,327, 10–19–71. Cl. D5—4.
Hart, Richard S., to The Telex Corp. Headphone. 222,361, 10–19–71, Cl. D26—14.
Harty, Millard F., Jr., to Motor Wheel Corp. Wheel. 222,348, 10–19–71, Cl. D14—30.
Hensel, Harvey L.: *See*—
Thomas, Harold A. 222,372.
Hesston Corp.: *See*—
Fell, Ferol S., Long, and McMillen. 222,377.
Hewlett-Packard Co.: *See*—
Inhelder, Allen E., and Hoogner. 222,356.
Hollywood Accessories (a division of Orion Industries, Inc.): *See*—
Berkoff, Daniel A. 222,378.
Hoogner, Richard L.: *See*—
Inhelder, Allen E., and Hoogner. 222,356.
Huyler, George R.: *See*—
Koch, Walter L., Franklin, and Huyler. 222,385.
Koch, Walter L., Franklin, and Huyler. 222,389.
Inhelder, Allen E., and R. L. Hoogner, to Hewlett-Packard Co. Power module. 222,356, 10–19–71, Cl. D26—1.
James, Robert E.: *See*—
Ottinger, Lester V., James, and Carmellini. 222,344.
Just-O Corp.: *See*—
Smith, George J. 222,368.
Justus Koe & Sons, Inc.: *See*—
Cousins, Michael A. 222,384.
Kabushiki Kaisha Asakusa Gangu: *See*—
Tachi, Ichiro. 222,373.
Tachi, Ichiro. 222,374.
Kimble, Thomas E., to D. H. Baldwin Co. Organ console. 222,393, 10–19–71, Cl. D56—2.
Kirschner, Robert K., to Sundstrand Data Control, Inc. Aircraft landing unit. 222,386, 10–19–71, Cl. D52—6.
Kmiclkewicz, Nestor A. Plaque. 222,364, 10–19–71, Cl. D29—23.
Koch, Walter L., R. P. Franklin, and G. R. Huyler, to Rowe International, Inc. Vending machine cabinet. 222,385, 10–19–71, Cl. D52—3.
Koch, Walter L., R. P. Franklin, and G. R. Huyler, to Rowe International, Inc. Vending machine cabinet. 222,389, 10–19–71, Cl. D52—3.
Krifchin, Benjamin, to General Crafts Corp. Handbag or the like. 222,406, 10–19–71, Cl. D87—3.
Lang, Vincent F. Carrying case for a camera or the like. 222,407, 10–19–71, Cl. D87—5.
Laws, Ira G., and E. J. Crossland, to Seismograph Service Corp. Card punching stylus. 222,399, 10–19–71, Cl. D74—1.
Leary, Donald J., to Owens-Illinois, Inc. Bottle. 222,336, 10–19–71, Cl. D9—87.
Levin, Monte L., to Scovill Mfg. Co. Electric can opener. 222,330, 10–19–71, Cl. D8—36.
Lewis, Paul E., and R. W. Harmon, to A. B. Chance Co. Electrical conductor support. 222,334, 10–19–71, Cl. D8—230.
Locher, Albert. Casing for communications equipment or the like. 222,357, 10–19–71, Cl. D26—5.
Long, William D.: *See*—
Fell, Ferol S., Long, and McMillen. 222,377.
Lorch, Inc.: *See*—
Harrison, Benjamin F., Jr., and Barnes. 222,326.
Harrison, Benjamin F., Jr., and Barnes. 222,327.
Maliskas, John S., to General Electric Co. Cassette tape recorder. 222,360, 10–19–71. Cl. D26—14.
Mast-Foods Mfg. Co., Inc.: *See*—
Mead, Robert B. 222,376.
McClashon, James R., to New Trends Inc. Building. 222,345, 10–19–71, Cl. D13—1.
McMillen, Kenneth R.: *See*—
Fell, Ferol S., Long, and McMillen. 222,377.
Mead, Robert B., to Mast-Foods Mfg. Co., Inc. Riding mower. 222,376, 10–19–71, Cl. D40—1.
Meldrum, Charles R., fractional part interest to R. G. Mentag. Combined rule, protractor and erasing shield. 222,388, 10–19–71, Cl. D52—6.
Mentag, Robert G.: *See*—
Meldrum, Charles R. 222,388.
Mergenov, George. Chair. 222,351, 10–19–71, Cl. D15—11.
Mills, Joseph D. Fishing lure. 222,353, 10–19–71, Cl. D22—29.
Mock, George E., to Osborn Products, Inc. Precision internal thread gauge. 222,387, 10–19–71, Cl. D52—6.
Motivation Systems, Inc.: *See*—
Glisson, James T. 222,342.
Motor Wheel Corp.: *See*—
Harty, Millard Fillmore. 222,348.
Mullen, Charles F. Building complex. 222,343, 10–19–71. Cl. D13—1.
New Trends Inc.: *See*—
McClashon, James Robert. 222,345
Noorlander, Daniel O. Teat cup inflation punch and air vent cleaner. 222,383, 10–19–71, Cl. D49—22.
Osborn Products, Inc.: *See*—
Mock, George E. 222,387.
Ottinger, Lester V., R. E. James, and A. E. Carmellini, to U.S. Plywood-Champion Paper Inc. Wall paneling. 222,344, 10–19–71, Cl. D13—1.
Owens-Illinois, Inc.: *See*—
Leary, Donald J. 222,336.
Plummer, James E. 222,339.
Weckman, Richard L. 222,337.
Weckman, Richard L. 222,340.
Parfums Jean Desprez: *See*—
Desprez, Jean Marie Leon. 222,338.
Peterson, Donald W., to RCA Corp. Antenna for a radio or television set. 222,359, 10–19–71, Cl. D26—14.
Pinette, Normand A. Portable dowel head cutter. 222,390, 10–19–71, Cl. D54—4.
Piovani, Renato. Coffee percolator. 222,379, 10–19–71. Cl. D44—26.
Plummer, James E., to Owens-Illinois, Inc. Bottle. 222,339, 10–19–71, Cl. D9—115.
Pope, William K., to Uniroyal Inc. Pneumatic tire. 222,409, 10–19–71, Cl. D90—20.
Price, James Russell, to Textron Inc. Fork or similar article. 222,391, 10–19–71, Cl. D54—12.
RCA Corp.: *See*—
Di Meo, Franklin R. 222,358.
Peterson, Donald W. 222,359.
Riley, Terence G., to Stanley Works Limited. Knife. 222,421, 10–19–71, Cl. D95—3.
Roberts, John E. Pedestrain signal. 222,398, 10–19–71, Cl. D72—1.
Rock, John W., to Cannon Mills Co. Towel or similar article. 222,411, 10–19–71, Cl. D92—26.
Rock, John W., to Cannon Mills Co. Textile fabric. 222,412, 10–19–71, Cl. D92—1.
Rock, John W., to Cannon Mills Co. Textile fabric. 222,417, 10–19–71, Cl. D92—1.
Rock, John W., to Cannon Mills Co. Towel or similar article. 222,419, 10–19–71, Cl. D92—26.
Rock, John W., to Cannon Mills Co. Towel or similar article. 222,420, 10–19–71, Cl. D92—26.
Rowe International, Inc.: *See*—
Koch, Walter L., Franklin, and Huyler. 222,385.
Koch, Walter L., Franklin, and Huyler. 222,389.
Scherer, Nancy A., to Cannon Mills Co. Towel or similar article. 222,413, 10–19–71, Cl. D92—26.
Scherer, Nancy A., to Cannon Mills Co. Towel or similar article. 222,414, 10–19–71, Cl. D92—26.
Scherer, Nancy A., to Cannon Mills Co. Textile fabric. 222,415, 10–19–71, Cl. D92—1.
Schmelzer, William C. Travel trailer. 222,346, 10–19–71, Cl. D14—3.
Schroer, Charles E., and J. J. Hamilton, to Hamilton Cosco, Inc. Modular cabinet. 222,369, 10–19–71, Cl. D33—19.
Scoville Mfg. Co.: *See*—
Levin, Monte L. 222,330.
Seismograph Service Corp.: *See*—
Laws, Ira G., and Crossland. 222,399.
Sen, Soshitsu. Tea room unit. 222,341, 10–19–71, Cl. D13—1.
Shultz, William E. Valve spring compressing tool. 222,331, 10–19–71, Cl. D8—51.
Silverman, Theodore. Billiard table pocket. 222,370, 10–19–71, Cl. D34—3.
Simon, Dan E. Hair brush handle. 222,324, 10–19–71, Cl. D4—35.
Singer Co., The: *See*—
Current, Wayne A. 222,332.
Smith, George J., to Just-O Corp. End standard for a gun rack. 222,368, 10–19–71, Cl. D33—3.
Sorensen, Christen W. Furniture cushion or similar article. 222,349, 10–19–71, Cl. D15—8.
South Bend Toy Mfg. Co.: *See*—
Chreist, Louis R. 222,371.
Stanley Works Ltd.: *See*—
Riley, Terence G. 222,421.
Sundberg, Carl W., M. Ferar, and C. J. Barecki, to American Seating Co. Chair. 222,350, 10–19–71, Cl. D15—8.
Sundstrand Data Control, Inc.: *See*—
Kirschner, Robert K. 222,386.
Tachi, Ichiro, to Kabushiki Kaisha Asakusa Gangu. Toy locomotive. 222,373, 10–19–71, Cl. D34—15.
Tachi, Ichiro, to Kabushiki Kaisha Asakusa Gangu. Toy ship. 222,374, 10–19–71, Cl. D34—15.
Taylor, Murland L. Valve bag packer. 222,392, 10–19–71, Cl. D35—1.
Telex Corp., The: *See*—
Hart, Richard S. 222,361.
Textron Inc.: *See*—
Fontaine, Raymond C. 222,381.
Price, James R. 222,391.
Thomas, Harold A., to Hensel, Harvey L. Golf club. 222,372, 10–19–71. Cl. D34—5.
Tomonelli, Bernard J.: *See*—
Foltz, Charles J., and Tomonelli. 222,354.
U.S. Plywood-Champion Paper Inc.: *See*—
Ottinger, Lester V., James, and Carmellini. 222,344.
Uniroyal Inc.: *See*—
Pope, William K. 222,409.

Vecchione, John S., to Parker Mfg. Co. Handle. 222,328, 10–19–71, Cl. D8—5.
Watson, Jack C. Key holder. 222,408, 10–19–71, Cl. D87—8.
Weckman, Richard L., to Owens-Illinois, Inc. Bottle. 222,337, 10–19–71, Cl. D9—115.
Weckman, Richard L., to Owens-Illinois, Inc. Bottle. 222,340, 10–19–71, Cl. D9—158.
White, Winsor D., Jr., to D. H. Baldwin Co. Piano. 222,394, 10–19–71, Cl. D56—9.
White, Winsor D., Jr., to D. H. Baldwin Co. Piano. 222,395, 10–19–71, Cl. D56—9.
Williams, James R., to Williams & Lane, Inc. Electric power distribution apparatus. 222,362, 10–19–71, Cl. D26—15.
Williams & Lane, Inc.: *See*—
Williams, James R. 222,362.
Wolf, Murray, to Evans-Aristocrat Industries, Inc. Combined wallet and eyeglass case. 222,404, 10–19–71, Cl. D87—3.
Wolf, Murray. Combined wallet and eyeglass case. 222,405, 10–19–71, Cl. D87—3.

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NOTE.—First number, class; second number, subclass; third number, patent number

2— 3 : 3,613,113
3,613,314
10 : 3,613,115
12 : 3,613,116
149 : 3,613,117
195 : 3,613,118
224 : 3,613,119
3— 1 : 3,613,120
4— 40 : 3,613,121
110 : 3,613,122
3,613,123
166 : 3,613,124
172.14: 3,613,125
3,613,126
185 : 3,613,127
187 : 3,613,128
236 : 3,613,129
240 : 3,613,130
263 : 3,613,131
5—238 : 3,613,132
334 : 3,613,133
7— 14.1 : 3,613,134
8—158 : 3,613,135
9— 1 : 3,613,136
3,613,137
12—145 : 3,613,138
13— 13 : 3,614,284
14 : 3,614,285
18 : RE.27,196
14— 27 : 3,613,139
15— 21 : 3,613,140
98 : 3,613,141
104.94: 3,613,142
167 : 3,613,143
210 : 3,613,144
230.15: 3,613,145
231 : 3,613,146
236 : 3,613,147
250.29: 3,613,148
256.51: 3,613,149
16—134 : 3,613,150
180 : 3,613,151
189 : 3,613,152
17— 11.3 : 3,613,153
62 : 3,613,154
18— 1 : 3,613,155
2 : 3,613,156
5 : 3,613,157
8 : 3,613,158
3,613,170
3,613,173
12 : 3,613,160
3,613,161
14 : 3,613,159
3,613,162
16 : 3,613,163
.5 : 3,613,164
3,613,165
3,613,166
19 : 3,613,174
26 : 3,613,167
30 : 3,613,168
3,613,169
3,613,171
41 : 3,613,172
19—157 : 3,613,175
24— 31 : 3,613,176
73 : 3,613,177
3,613,178
123 : 3,613,179
205.1 : 3,613,180
216 : 3,613,181
253 : 3,613,182
265 : 3,613,183
3,613,184
25—118 : 3,613,185
26— 2 : 3,613,186
15 : 3,613,187
27— 21 : 3,613,188
35 : 3,613,189
28— 4 : 3,613,190
29— 1.3 : 3,613,191
24.5 : 3,613,193
26 : 3,613,192
33 : 3,613,194
91 : 3,613,196
95 : 3,613,197
96 : 3,613,198
105 : RE.27,192
116 : 3,613,199

29—132 : 3,613,200
149.5 : 3,613,201
3,613,202
155 : 3,613,203
3,613,204
3,613,205
157 : 3,613,207
.3 : 3,613,206
163.5 : 3,613,208
179 : 3,613,209
187 : 3,613,210
200 : 3,613,211
3,613,214
202 : 3,613,212
203 : 3,613,213
403 : 3,613,215
412 : 3,613,195
423 : 3,613,219
428 : 3,613,216
432.2 : 3,613,217
470.3 : 3,613,218
472.1 : 3,613,220
526 : 3,613,221
527.1 : 3,613,222
3,613,223
568 : 3,613,224
3,613,225
577 : 3,613,226
596 : 3,613,227
603 : 3,613,228
605 : 3,613,229
624 : 3,613,230
3,613,231
625 : 3,613,232
30— 30 : 3,613,233
31 : 3,613,234
91.1 : 3,613,235
92.5 : 3,613,236
133 : 3,613,237
136 : 3,613,238
248 : 3,613,240
293 : 3,613,239
294 : 3,613,241
305 : 3,613,242
314 : 3,613,243
32— 5 : 3,613,244
63 : 3,613,245
69 : 3,613,246
33— 1 : 3,613,247
18 : 3,613,248
61 : 3,613,249
63 : 3,613,250
72 : 3,613,251
184.5 : 3,613,252
34— 45 : 3,613,253
3,613,254
54 : 3,613,255
57 : 3,613,256
91 : 3,613,257
95 : 3,613,258
35— 1 : 3,613,259
8 : 3,613,260
3,613,261
3,613,262
10.4 : 3,614,286
11 : 3,613,263
19 : 3,613,264
20 : 3,613,265
22 : 3,613,266
29 : 3,613,267
31 : 3,613,268
48 : 3,613,269
36— 2.5 : 3,613,270
3,613,271
3,613,272
3,613,273
68 : 3,613,274
40— 31 : 3,613,275
36 : 3,613,276
65 : 3,613,277
96 : 3,613,278
152 : 3,613,279
155 : 3,613,280
359 : 3,613,281
42— 59 : 3,613,285
65 : 3,613,286
84 : 3,613,282
86 : 3,613,283
43— 18 : 3,613,287
26.1 : 3,613,284

43— 43.11: 3,613,289
.13: 3,613,290
46— 16 : 3,613,291
20 : 3,613,292
44 : 3,613,293
51 : 3,613,294
74 : 3,613,295
76 : 3,613,296
93 : 3,613,297
95 : 3,613,298
120 : 3,613,299
131 : 3,613,300
154 : 3,613,301
202 : 3,613,302
206 : 3,613,303
3,613,304
3,613,305
216 : 3,613,306
221 : 3,613,307
47— 17 : 3,613,308
38 : 3,613,309
48.5 : 3,613,310
49—136 : 3,613,311
220 : 3,613,312
420 : 3,613,313
425 : 3,613,314
51— 74 : 3,613,315
141 : 3,613,316
164.5 : 3,613,317
241 : 3,613,318
289 : 3,613,319
290 : 3,613,320
52— 73 : 3,613,321
83 : 3,613,322
169 : 3,613,323
173 : 3,613,324
236 : 3,613,325
314 : 3,613,326
489 : 3,613,327
555 : 3,613,328
582 : 3,613,329
53— 26 : 3,613,330
266 : 3,613,331
381 : 3,613,332
55— 89 : 3,613,333
222 : 3,613,334
56— 1 : 3,613,335
2 : 3,613,336
7 : 3,613,337
10.1 : 3,613,338
130 : 3,613,339
249 : 3,613,340
328 : 3,613,341
329 : 3,613,342
330 : 3,613,343
364 : 3,613,344
3,613,345
400 : 3,613,346
57— 1 : 3,613,347
58.86: 3,613,348
58— 4 : 3,613,349
23 : 3,613,350
3,613,351
50 : 3,613,352
59 : 3,613,353
126 : 3,613,354
59— 93 : 3,613,355
60— 6 : 3,613,356
10.5 : 3,613,357
24 : 3,613,358
30 : 3,613,359
39.28: 3,613,362
.36: 3,613,360
.41: 3,613,361
.52: 3,613,363
52 : 3,613,364
3,613,365
54 : 3,613,366
3,613,367
95 : 3,613,368
105 : 3,613,369
202 : 3,613,370
214 : 3,613,371
216 : 3,613,372
219 : 3,613,373
3,613,374
240 : 3,613,375
61— .5 : 3,613,378
1 : 3,613,376
3,613,377

61— 42 : 3,613,379
46 : 3,613,380
.5 : 3,613,381
49 : 3,613,382
85 : 3,613,383
3,613,384
62— 6 : 3,613,385
64 : 3,613,386
100 : 3,613,387
130 : 3,613,388
137 : 3,613,389
148 : 3,613,390
184 : 3,613,391
3,613,392
63— 14 : 3,613,393
64— 7 : 3,613,394
9 : 3,613,395
21 : 3,613,396
3,613,397
3,613,398
66— 55 : 3,613,399
57 : 3,613,400
60 : 3,613,401
107 : 3,613,402
125 : 3,613,403
140 : 3,613,404
68— 12 : 3,613,405
140 : 3,613,406
202 : 3,613,407
204 : 3,613,408
70— 38 : 3,613,409
202 : 3,613,410
232 : 3,613,411
252 : 3,613,412
298 : 3,613,413
414 : 3,613,414
447 : 3,613,415
456 : 3,613,416
72— 8 : 3,613,417
3,613,418
3,613,419
38 : 3,613,421
56 : 3,613,422
58 : 3,613,423
103 : 3,613,424
131 : 3,613,420
202 : 3,613,425
3,613,426
212 : 3,613,427
237 : 3,613,428
249 : 3,613,429
318 : 3,613,430
369 : 3,613,431
399 : 3,613,432
467 : 3,613,433
73— 35 : 3,613,434
37 : 3,613,435
3,613,436
73 : 3,613,437
113 : 3,613,438
118 : 3,613,439
132 : 3,613,440
133 : 3,613,457
141 : 3,613,441
3,613,442
147 : 3,613,443
157 : 3,613,444
159 : 3,613,445
170 : 3,613,446
193 : 3,613,447
205 : 3,613,448
228 : 3,613,449
231 : 3,613,450
3,613,451
339 : 3,613,452
351 : 3,613,453
362 : 3,613,454
418 : 3,613,455
439 : 3,613,456
504 : 3,613,458
506 : 3,613,459
543 : 3,613,460
74— 2 : 3,613,461
15.4 : 3,613,462
18.1 : 3,613,463
89.15: 3,613,464
110 : 3,613,465
215 : 3,613,467
217 : 3,613,466
3,613,468

74—361 : 3,613,469
393 : 3,613,470
3,613,471
411 : 3,613,472
424.7 : 3,613,473
484 : 3,613,474
491 : 3,613,475
492 : 3,613,476
493 : 3,613,477
565 : 3,613,478
688 : 3,613,479
733 : 3,613,480
753 : 3,613,481
824 : 3,613,483
850 : 3,613,482
869 : 3,613,484
76—101 : 3,613,485
81—180 : 3,613,486
82— 2.7 : 3,613,487
5.5 : 3,613,488
70.2 : 3,613,489
83—132 : 3,613,490
146 : 3,613,491
170 : 3,613,492
639 : 3,613,493
84— 1.01: 3,614,287
.21: 3,614,288
448 : 3,613,494
85— 65 : 3,613,495
69 : 3,613,496
84 : 3,613,497
89— 1.5 : 3,613,498
8 : 3,613,499
26 : 3,613,500
90— 13 : 3,613,501
14 : 3,613,502
91— 26 : 3,613,503
32 : 3,613,504
35 : 3,613,505
369 : 3,613,506
398 : 3,613,507
420 : 3,613,508
459 : 3,613,509
478 : 3,613,510
502 : 3,613,511
92— 13.8 : 3,613,512
48 : 3,613,513
3,613,514
63 : 3,613,515
85 : 3,613,516
98 : 3,613,517
3,613,518
125 : 3,613,519
133 : 3,613,520
186 : 3,613,521
93— 1 : 3,613,522
8 : 3,613,523
33 : 3,613,524
35 : 3,613,288
53 : 3,613,525
3,613,526
3,613,527
58.4 : 3,613,528
93 : 3,613,529
94— 46 : 3,613,530
95— 1.1 : 3,613,531
4.5 : 3,613,532
10 : 3,613,533
3,613,534
3,613,535
3,613,536
13 : 3,613,537
15 : 3,613,538
18 : 3,613,539
31 : 3,613,540
3,613,541
3,613,542
42 : 3,613,543
45 : 3,613,544
66 : 3,613,545
86 : 3,613,546
96 : 3,613,547
98— 38 : 3,613,548
99—236 : 3,613,549
330 : 3,613,550
360 : 3,613,551
426 : 3,613,552
3,613,553
446 : 3,613,554
3,613,555

100— 14 : 3,613,556
26 : 3,613,557
35 : 3,613,558
49 : 3,613,559
52 : 3,613,560
53 : 3,613,561
74 : 3,613,562
100 : RE.27,194
115 : 3,613,563
118 : 3,613,564
215 : 3,613,565
218 : 3,613,566
226 : 3,613,567
229 : 3,613,568
3,613,569
101— 9 : 3,613,570
40 : 3,613,571
91 : 3,613,572
92 : 3,613,573
93 : 3,613,574
148 : 3,613,575
180 : 3,613,576
247 : 3,613,577
350 : 3,613,578
102— 4 : 3,613,579
3,613,580
24 : 3,613,581
3,613,582
37.8 : 3,613,583
38 : 3,613,584
40 : 3,613,587
44 : 3,613,588
52 : 3,613,585
67 : 3,613,586
70.2 : 3,613,589
3,613,590
3,613,591
3,613,592
76 : 3,613,593
79 : 3,613,594
83 : 3,613,595
94 : 3,613,596
100 : 3,613,597
104— 6 : 3,613,598
18 : 3,613,599
91 : 3,613,600
197 : 3,613,601
105—261 : 3,613,602
107— 14 : 3,613,603
108— 42 : 3,613,604
58 : 3,613,605
153 : 3,613,606
110— 18 : 3,613,607
112— 2 : 3,613,608
235 : 3,613,609
262 : 3,613,610
265 : 3,613,611
410 : 3,613,612
113— 80 : 3,613,613
114— 16 : 3,613,614
3,613,615
3,613,640
.5 : 3,613,616
21 : 3,613,618
3,613,619
61 : 3,613,620
66 : 3,613,621
.5 : 3,613,622
73 : 3,613,623
144 : 3,613,624
230 : 3,613,625
235 : 3,613,626
3,613,627
3,613,628
3,613,629
115— 12 : 3,613,630
17 : 3,613,631
18 : 3,613,632
118— 5 : 3,613,633
50 : 3,613,634
406 : 3,613,635
637 : 3,613,636
3,613,637
3,613,638
119— 15 : 3,613,639
51.11: 3,613,641
75 : 3,613,642
122— 34 : 3,613,643
123— 8.07: RE.27,191
32 : 3,613,644

123— 41.46: 3,613,645
75 : 3,613,646
90.22: 3,613,647
103 : 3,613,648
119 : 3,613,649
3,613,650
140 : 3,613,651
146 : 3,613,653
.5 : 3,613,652
148 : RE.27,197
3,613,654
124— 6 : 3,613,655
126— 21 : 3,613,656
41 : 3,613,657
59.5 : 3,613,658
270 : 3,613,659
298 : 3,613,660
128— 1 : 3,613,661
2 : 3,613,662
3,613,663
3,613,664
3,613,665
3,613,666
3,613,670
.05: 3,613,667
3,613,668
.06: 3,613,669
24 : 3,613,671
.5 : 3,613,672
33 : 3,613,673
83.5 : 3,613,674
90 : 3,613,675
132 : 3,613,676
145.6 : 3,613,677
146.2 : 3,613,678
169 : 3,613,679
224 : 3,613,680
269 : 3,613,685
288 : 3,613,686
3,613,687
290 : 3,613,688
293 : 3,613,681
303.1 : 3,613,682
3,613,689
325 : 3,613,683
347 : 3,613,684
355 : 3,613,690
130— 23 : 3,613,691
131— 84 : 3,613,692
140 : 3,613,693
132— 45 : 3,613,694
53 : 3,613,695
73.6 : 3,613,696
79 : 3,613,697
84 : 3,613,698
134— 57 : 3,613,699
3,613,700
64 : 3,613,701
135— 20 : 3,613,702
137— 1 : 3,613,703
15.2 : 3,613,704
81.5 : 3,613,705
3,613,706
3,613,707
3,613,708
3,613,709
102 : 3,613,710
115 : 3,613,711
155 : 3,613,712
216.2 : 3,613,713
263 : 3,613,714
269 : 3,613,715
491 : 3,613,716
3,613,717
493 : 3,613,718
522 : 3,613,719
527.8 : 3,613,720
551 : 3,613,721
599 : 3,613,722
604 : 3,613,723
612.1 : 3,613,724
613 : 3,613,725
614.03: 3,613,726
.17: 3,613,727
.19: 3,613,728
624.18: 3,613,729
625.29: 3,613,731
.44: 3,613,732
.6 : 3,613,730
.65: 3,613,733
138— 31 : 3,613,734
45 : 3,613,735
109 : 3,613,736
149 : 3,613,737
156 : 3,613,738
139— 1 : 3,613,739
122 : 3,613,740
127 : 3,613,741
336 : 3,613,742
348 : 3,613,743
371 : 3,613,744
140—118 : 3,613,745
141— 5 : 3,613,746
198 : 3,613,747
143— 43 : 3,613,748
135 : 3,613,749

144— 3 : 3,613,750
32 : 3,613,751
34 : 3,613,752
145— 61 : 3,613,753
146—102 : 3,613,754
192 : 3,613,755
221 : 3,613,756
147— 1 : 3,613,757
149— 15 : 3,613,758
150— 29 : 3,613,759
52 : 3,613,760
3,613,761
152—354 : 3,613,762
359 : 3,613,763
157— 1.26: 3,613,764
160— 1 : 3,613,765
164— 46 : 3,613,766
76 : 3,613,767
120 : 3,613,768
166 : 3,613,769
192 : 3,613,770
282 : 3,613,771
312 : 3,613,772
165— 32 : 3,613,773
3,613,774
46 : 3,613,775
48 : 3,613,776
86 : 3,613,777
105 : 3,613,778
133 : 3,613,779
134 : 3,613,780
145 : 3,613,781
166 : 3,613,782
166— .5 : 3,613,783
187 : 3,613,784
252 : RE.27,198
RE.27,199
271 : 3,613,785
273 : 3,613,786
3,613,787
279 : 3,613,788
281 : 3,613,789
294 : 3,613,790
305 : 3,613,791
315 : 3,613,792
169— 26 : 3,613,793
28 : 3,613,794
42 : 3,613,795
171— 27 : 3,613,796
61 : 3,613,797
172— 9 : 3,613,798
40 : 3,613,799
197 : 3,613,802
447 : 3,613,800
456 : 3,613,801
699 : 3,613,803
173—149 : 3,613,804
174— 19 : 3,614,289
26 : 3,614,290
42 : 3,614,291
45 : 3,614,292
52 : 3,614,293
84 : 3,614,294
87 : 3,614,295
3,614,296
88 : 3,614,297
92 : 3,614,298
107 : 3,614,299
115 : 3,614,300
126 : 3,614,301
175— 27 : 3,613,805
48 : 3,613,806
209 : 3,613,807
177— 53 : 3,613,808
178— 5.04: 3,614,304
.2 : 3,614,302
.4 : 3,614,303
3,614,305
6 : 3,614,306
3,614,307
.6 : 3,614,308
3,614,309
.8 : 3,614,310
3,614,311
7.3 : 3,614,312
.6 : 3,614,313
.88: 3,614,314
17 : 3,614,315
22 : 3,614,316
66 : 3,614,317
68 : 3,614,318
69.5 : 3,614,319
179— 1 : 3,614,320
3,614,321
3,614,322
.5 : 3,614,323
2 : 3,614,324
3,614,325
3,614,326
15 : 3,614,327
3,614,328
18 : 3,614,329
3,614,330
90 : 3,614,331
100 : 3,614,337
.1 : 3,614,336

179—100.2 : 3,614,333
3,614,338
3,614,339
3,614,341
3,614,342
3,614,343
.41: 3,614,332
107 : 3,614,334
115.5 : 3,614,335
182 : 3,614,344
180— 5 : 3,613,809
3,613,810
3,613,811
3,613,812
6.48: 3,613,817
.5 : 3,613,813
19 : 3,613,814
53 : 3,613,815
3,613,816
79.2 : 3,613,818
82 : 3,613,819
105 : 3,613,820
125 : 3,613,821
128 : 3,613,822
181— .5 : 3,613,823
3,613,824
33 : 3,613,825
3,613,826
3,613,827
48 : 3,613,828
53 : 3,613,829
54 : 3,613,830
182— 27 : 3,613,831
179 : 3,613,832
184— 6 : 3,613,833
187— 17 : 3,613,834
29 : 3,613,835
188— 71.1 : 3,613,836
72.9 : 3,613,837
163 : 3,613,838
170 : 3,613,839
197 : 3,613,840
265 : 3,613,841
306 : 3,613,842
190— 50 : 3,613,843
191— 32 : 3,614,340
192— 4 : 3,613,844
8 : 3,613,845
41 : 3,613,846
58 : 3,613,847
70.28: 3,613,848
84 : 3,613,849
105 : 3,613,850
107 : 3,613,851
150 : 3,613,853
194— 10 : 3,613,854
51 : 3,613,855
197— 54 : 3,613,856
151 : 3,613,857
198— 19 : 3,613,858
24 : RE.27,190
29 : 3,613,859
30 : 3,613,860
33 : 3,613,861
3,613,862
3,613,863
38 : 3,613,864
127 : 3,613,852
131 : 3,613,865
139 : 3,613,866
177 : 3,613,867
211 : 3,613,868
220 : 3,613,869
3,613,870
200— 2 : 3,614,345
16 : 3,614,346
3,614,347
33 : 3,614,348
47 : 3,614,349
50 : 3,614,350
61.86: 3,614,351
82 : 3,614,352
144 : 3,614,353
146 : 3,614,354
148 : 3,614,355
3,614,356
3,614,357
150 : 3,614,358
166 : 3,614,359
3,614,360
3,614,361
167 : 3,614,362
168 : 3,614,363
172 : 3,614,364
206— 1 : 3,613,871
4 : 3,613,872
45.15: 3,613,873
46 : 3,613,874
47 : 3,613,875
52 : 3,613,876
53 : 3,613,877
56 : 3,613,878
63.3 : 3,613,879
65 : 3,613,880
3,613,881
209— 73 : 3,613,882

209— 74 : 3,613,883
111.6 : 3,613,884
.7 : 3,613,885
125 : 3,613,886
211 : 3,613,887
210— 80 : 3,613,888
84 : 3,613,889
150 : 3,613,890
242 : 3,613,891
272 : 3,613,893
374 : 3,613,892
456 : 3,613,894
211— 40 : 3,613,895
107 : 3,613,896
120 : 3,613,897
124 : 3,613,898
133 : 3,613,899
148 : 3,613,900
166 : 3,613,901
213— 72 : 3,613,902
214— 1 : 3,613,903
3,613,904
2.5 : 3,613,905
3,613,906
10.5 : 3,613,907
16.1 : 3,613,908
3,613,909
.4 : 3,613,910
3,613,911
17 : 3,613,912
35 : 3,613,913
38 : 3,613,914
41 : 3,613,915
62 : 3,613,916
75 : 3,613,917
3,613,918
85 : 3,613,920
3,613,921
.1 : 3,613,919
138 : 3,613,922
147 : 3,613,923
313 : 3,613,924
394 : 3,613,925
520 : 3,613,926
622 : 3,613,927
778 : 3,614,273
215— 9 : 3,613,928
3,613,929
32 : 3,613,930
217— 12 : 3,613,931
219— 10.43: 3,614,369
.55: 3,614,365
.69: 3,614,366
69 : 3,614,367
3,614,368
3,614,370
3,614,371
3,614,372
3,614,373
91 : 3,614,374
3,614,375
121 : 3,614,376
131 : 3,614,377
137 : 3,614,378
3,614,379
146 : 3,614,380
222 : 3,614,381
223 : 3,614,382
243 : 3,614,383
303 : 3,614,385
312 : 3,614,386
328 : 3,614,387
400 : 3,614,388
421 : 3,614,389
469 : 3,614,390
501 : 3,614,391
3,614,392
220— 4 : 3,613,933
9 : 3,613,932
14 : 3,613,934
24 : 3,613,935
.5 : 3,613,936
26 : 3,613,937
44 : 3,613,938
46 : 3,613,939
60 : 3,613,940
64 : 3,613,957
71 : 3,613,941
88 : 3,613,942
97 : 3,613,943
113 : 3,613,944
221—109 : 3,613,946
125 : 3,613,947
250 : 3,613,948
295 : 3,613,945
310 : 3,613,949
222— 16 : 3,613,950
36 : 3,613,951
43 : 3,613,952
56 : 3,613,953
61 : 3,613,954
83 : 3,613,955
136 : 3,613,956
180 : 3,613,958
187 : 3,613,959
330 : 3,613,960

222—389 : 3,613,961
3,613,962
3,613,963
402.24: 3,613,964
505 : 3,613,965
529 : 3,613,966
223— 32 : 3,613,967
3,613,968
57 : 3,613,969
224— 36 : 3,613,970
42.01: 3,613,971
.42: 3,613,972
225— 47 : 3,613,973
93.5 : 3,613,974
226— 25 : 3,613,975
78 : 3,613,976
91 : 3,613,977
117 : 3,613,978
142 : 3,613,979
162 : 3,613,980
227— 1 : 3,613,981
228— 2 : 3,613,982
3,613,983
3 : 3,613,984
229— 14 : 3,613,985
17 : 3,613,986
44 : 3,613,987
233— 2 : 3,613,988
13 : 3,613,989
235— 60 : 3,613,990
61 : 3,614,393
.11: 3,614,395
.12: 3,614,396
.9 : 3,614,394
85 : 3,613,991
92 : 3,614,397
150.1 : 3,614,398
151.12: 3,614,682
152 : 3,614,399
3,614,400
153 : 3,614,401
154 : 3,614,402
155 : 3,614,403
159 : 3,614,404
160 : 3,614,405
168 : 3,614,406
181 : 3,614,407
183 : 3,614,408
3,614,409
186 : 3,614,410
194 : 3,614,411
239— 2 : 3,613,992
3 : 3,613,993
44 : 3,613,994
96 : 3,614,469
200 : 3,613,995
265.13: 3,613,996
310 : 3,613,997
453 : 3,613,998
553.3 : 3,613,999
240— 1.3 : 3,614,412
3,614,413
2 : 3,614,414
.18: 3,614,415
8.25: 3,614,416
52 : 3,614,417
174.1 : 3,614,756
241— 5 : 3,614,000
23 : 3,614,001
51 : 3,614,002
79.3 : 3,614,003
202 : 3,614,023
214 : 3,614,004
242— 7.22: 3,614,005
20 : 3,614,006
46.4 : 3,614,007
55.16: 3,614,008
.19: 3,614,009
56 : 3,614,010
64 : 3,614,011
71.2 : 3,614,012
74 : 3,614,013
75.2 : 3,614,014
84.1 : 3,614,015
106 : 3,614,016
118.3 : 3,614,017
.61: 3,614,018
157.1 : 3,614,019
188 : 3,614,020
3,614,021
198 : 3,614,022
244— 2 : 3,614,024
3.13: 3,614,025
.22: 3,614,026
3,614,027
15 : 3,614,028
17.23: 3,614,029
23 : 3,614,030
32 : 3,614,031
36 : 3,614,032
48 : 3,614,033
56 : 3,614,034
77 : 3,614,035
3,614,036
110 : 3,614,037
134 : 3,614,038

246—128 : 3,614,418
248— 2 : 3,614,039
11 : 3,614,040
97 : 3,614,041
3,614,042
3,614,043
243 : 3,614,044
262 : 3,614,045
343 : 3,614,046
439 : 3,614,047
249— 18 : 3,614,048
19 : 3,614,049
26 : 3,614,050
27 : 3,614,051
43 : 3,614,052
105 : 3,614,053
179 : 3,614,054
250— 41.9 : 3,614,420
43.5 : 3,614,421
3,614,431
49.5 : 3,614,422
3,614,423
3,614,424
51.5 : 3,614,425
52 : 3,614,432
61.5 : 3,614,426
65 : 3,614,427
3,614,428
71 : 3,614,429
3,614,430
3,614,433
.5 : 3,614,434
3,614,435
3,614,436
83.1 : 3,614,437
.3 : 3,614,438
3,614,439
3,614,441
.6 : 3,614,442
3,614,443
3,614,444
3,614,445
84.5 : 3,614,440
108 : 3,614,446
199 : 3,614,447
202 : 3,614,448
203 : 3,614,449
210 : 3,614,450
217 : 3,614,451
218 : 3,614,452
219 : 3,614,453
3,614,454
3,614,455
223 : 3,614,419
234 : 3,614,456
251— 61.2 : 3,614,055
144 : 3,614,056
251 : 3,614,057
266 : 3,614,058
267 : 3,614,059
317 : 3,614,060
327 : 3,614,061
354 : 3,614,062
355 : 3,614,063
254— 86 : 3,614,064
122 : 3,614,065
185 : 3,614,066
190 : 3,614,067
256— 19 : 3,614,068
259— 1 : 3,614,069
102 : 3,614,070
147 : 3,614,071
261— 36 : 3,614,072
263— 20 : 3,614,073
40 : 3,614,074
52 : 3,614,075
266— 21 : 3,614,076
23 : 3,614,077
3,614,078
33 : 3,614,079
34 : 3,614,080
3,614,081
38 : 3,614,082
41 : 3,614,083
267—153 : 3,614,084
269—328 : 3,614,085
270— 56 : 3,614,086
60 : 3,614,087
271— 26 : 3,614,089
51 : 3,614,090
52 : 3,614,091
3,614,092
56 : 3,614,093
59 : 3,614,094
64 : 3,614,095
80 : 3,614,088
272— 30 : 3,614,096
72 : 3,614,097
79 : 3,614,098
273— 1.5 : 3,614,099
75 : 3,614,100
80.2 : 3,614,101
105.6 : 3,614,102
106.5 : 3,614,103
134 : 3,614,104
146 : 3,614,105

273–156 : 3,614,106
188 : 3,614,107
190 : 3,614,108
274– 4 : 3,614,109
9 : 3,614,110
277– 3 : 3,614,111
19 : 3,614,112
94 : 3,614,113
165 : 3,614,114
280– 5.32: 3,614,115
11.13: 3,614,116
.35: 3,614,117
3,614,118
3,614,119
32.5 : 3,614,120
33.99: 3,614,133
104.5 : 3,614,121
3,614,122
3,614,123
106 : 3,614,124
124 : 3,614,125
150 : 3,614,126
3,614,127
3,614,128
3,614,129
261 : 3,614,130
289 : 3,614,131
3,614,132
456 : 3,614,134
491 : 3,614,135
500 : 3,614,136
285–390 : 3,614,137
287– 20.3 : 3,614,138
52 : 3,614,139
.06: 3,614,140
99 : 3,614,141
108 : 3,614,142
126 : 3,614,143
189.35: 3,614,144
290– 40 : 3,614,457
292– 92 : 3,614,145
216 : 3,614,146
254 : 3,614,147
293– 72 : 3,614,148
294– 19 : 3,614,149
78 : 3,614,150
104 : 3,614,151
296– 23 : 3,614,152
35 : 3,614,153
137 : 3,614,154
297–129 : 3,614,155
224 : 3,614,156
248 : 3,614,157
3,614,158
452 : 3,614,159
299– 1 : 3,614,160
10 : 3,614,161
14 : 3,614,163
67 : 3,614,162
83 : 3,614,164
300– 10 : 3,614,165
302– 2 : 3,614,166
14 : 3,614,167
31 : 3,614,168
303– 6 : 3,614,169
7 : 3,614,170
21 : 3,614,171
3,614,172
3,614,173
3,614,174
22 : 3,614,175
61 : 3,614,176
305– 57 : 3,614,177
307– 10 : 3,614,458
3,614,459
3,614,460
64 : 3,614,461
88.3 : 3,614,462
3,614,463
136 : 3,614,464
139 : 3,614,465
202 : 3,614,466
215 : 3,614,467
3,614,468
228 : 3,614,470

307–241 : 3,614,471
252 : 3,614,474
255 : 3,614,472
262 : 3,614,475
273 : 3,614,473
279 : 3,614,476
3,614,477
295 : 3,614,478
297 : 3,614,479
299 : 3,614,480
308– 4 : 3,614,178
6 : 3,614,179
10 : 3,614,180
3,614,181
72 : 3,614,182
187.1 : 3,614,183
310– 6 : 3,614,481
8.1 : 3,614,482
3,614,483
.2 : 3,614,484
3,614,485
3,614,486
.4 : 3,614,487
.6 : 3,614,488
11 : 3,614,489
25 : 3,614,490
37 : 3,614,491
41 : 3,614,492
54 : 3,614,493
126 : 3,614,494
162 : 3,614,495
3,614,496
213 : 3,614,497
262 : 3,614,498
312– 8 : 3,614,184
184 : 3,614,185
194 : 3,614,186
351 : 3,614,187
313– 65 : 3,614,499
69 : 3,614,500
70 : 3,614,501
77 : 3,614,502
92 : 3,614,503
3,614,504
153 : 3,614,505
174 : 3,614,506
3,614,507
184 : 3,614,508
201 : 3,614,509
207 : 3,614,510
220 : 3,614,511
230 : 3,614,512
260 : 3,614,513
346 : 3,614,514
315– 3.5 : 3,614,515
3,614,516
.6 : 3,614,517
5.53: 3,614,518
8 : 3,614,519
15 : 3,614,520
22 : 3,614,521
26 : 3,614,522
36 : 3,614,523
84.6 : 3,614,524
111 : 3,614,525
169 : 3,614,526
199 : 3,614,527
241 : 3,614,528
317– 2 : 3,614,529
11 : 3,614,530
16 : 3,614,531
3,614,532
18 : 3,614,533
3,614,534
40 : 3,614,535
74 : 3,614,536
99 : 3,614,537
3,614,538
3,614,539
101 : 3,614,541
104 : 3,614,540
151 : 3,614,542
154 : 3,614,543
230 : 3,614,544
3,614,545

317–234 : 3,614,546
3,614,547
3,614,548
3,614,549
3,614,550
3,614,551
235 : 3,614,552
3,614,553
3,614,554
3,614,555
3,614,556
3,614,557
3,614,558
3,614,560
238 : 3,614,559
258 : 3,614,561
262 : 3,614,562
318– 7 : 3,614,563
52 : 3,614,564
203 : 3,614,565
211 : 3,614,566
305 : 3,614,567
344 : 3,614,568
345 : 3,614,569
3,614,571
396 : 3,614,572
443 : 3,614,573
467 : 3,614,574
486 : 3,614,570
569 : 3,614,575
625 : 3,614,576
654 : 3,614,577
673 : 3,614,578
676 : 3,614,579
696 : 3,614,580
320– 5 : 3,614,582
3,614,583
6 : 3,614,581
35 : 3,614,584
321– 2 : 3,614,585
3,614,586
3,614,587
8 : 3,614,588
9 : 3,614,589
3,614,590
16 : 3,614,591
44 : RE.27,193
45 : 3,614,594
69 : 3,614,592
322– 28 : 3,614,593
323– 6 : 3,614,595
22 : 3,614,596
43.5 : 3,614,597
44 : 3,614,599
75 : 3,614,598
324– 4 : 3,614,600
28 : 3,614,601
32 : 3,614,602
34 : 3,614,603
3,614,618
38 : 3,614,604
54 : 3,614,605
61 : 3,614,606
71 : 3,614,607
73 : 3,614,608
77 : 3,614,609
78 : 3,614,619
115 : 3,614,610
142 : 3,614,611
154 : 3,614,612
158 : 3,614,613
3,614,614
161 : 3,614,615
165 : 3,614,616
166 : 3,614,617
325– 30 : 3,614,620
42 : 3,614,622
3,614,623
163 : 3,614,624
307 : 3,614,625
323 : 3,614,626
334 : 3,614,621
345 : 3,614,627
355 : 3,614,629
365 : 3,614,628

325–421 : 3,614,630
328– 48 : 3,614,631
58 : 3,614,632
127 : 3,614,633
140 : 3,614,634
155 : 3,614,635
162 : 3,614,636
167 : 3,614,637
237 : 3,614,638
329–104 : 3,614,639
110 : 3,614,640
3,614,641
330– 4.3 : 3,614,642
5.5 : 3,614,643
28 : 3,614,644
30 : 3,614,645
59 : 3,614,646
124 : 3,614,647
331– 14 : 3,614,648
17 : 3,614,649
52 : 3,614,650
65 : 3,614,651
94.5 : 3,614,652
3,614,653
3,614,654
3,614,655
3,614,656
3,614,657
3,614,658
3,614,659
3,614,660
3,614,661
3,614,662
3,614,663
101 : 3,614,665
110 : 3,614,664
177 : 3,614,666
332– 24 : 3,614,668
26 : 3,614,667
37 : 3,614,669
333– 1.1 : 3,614,670
7 : 3,614,671
10 : 3,614,672
18 : 3,614,673
20 : 3,614,674
24.2 : 3,614,675
26 : 3,614,676
71 : 3,614,677
72 : 3,614,678
80 : 3,614,679
335–132 : 3,614,680
140 : 3,614,681
152 : 3,614,683
166 : 3,614,684
3,614,685
167 : 3,614,686
195 : 3,614,687
210 : 3,614,688
229 : 3,614,689
250 : 3,614,690
306 : 3,614,691
336– 15 : 3,614,692
58 : 3,614,693
63 : 3,614,709
130 : RE.27,195
174 : 3,614,694
210 : 3,614,695
215 : 3,614,696
337– 6 : 3,614,697
81 : 3,614,698
203 : 3,614,700
244 : 3,614,699
341 : 3,614,701
381 : 3,614,702
338–140 : 3,614,704
174 : 3,614,703
339– 8 : 3,614,705
3,614,750
14 : 3,614,706
17 : 3,614,707
36 : 3,614,708
75 : 3,614,710
90 : 3,614,711
127 : 3,614,712
128 : 3,614,713

339–186 : 3,614,714
252 : 3,614,715
256 : 3,614,716
262 : 3,614,717
276 : 3,614,718
340– 3 : 3,614,719
3,614,720
5 : 3,614,721
6 : 3,614,722
16 : 3,614,723
3,614,724
17 : 3,614,725
18 : 3,614,726
22 : 3,614,727
23 : 3,614,728
38 : 3,614,729
57 : 3,614,731
58 : 3,614,732
59 : 3,614,730
64 : 3,614,734
87 : 3,614,733
146.1 : 3,614,735
.3 : 3,614,736
3,614,737
163 : 3,614,738
166 : 3,614,739
172.5 : 3,614,740
3,614,741
3,614,742
3,614,743
3,614,744
3,614,745
3,614,746
3,614,747
173 : 3,614,748
3,614,749
3,614,751
3,614,752
3,614,753
.2 : 3,614,754
174 : 3,614,755
.1 : 3,614,757
3,614,758
212 : 3,614,759
224 : 3,614,760
239 : 3,614,761
244 : 3,614,762
279 : 3,614,763
324 : 3,614,764
3,614,765
3,614,766
3,614,767
3,614,769
325 : 3,614,768
328 : 3,614,770
336 : 3,614,771
343 : 3,614,773
347 : 3,614,772
3,614,774
3,614,775
3,614,776
3,614,777
343– 5 : 3,614,778
6 : 3,614,779
7 : 3,614,780
3,614,781
3,614,782
3,614,783
.7 : 3,614,784
3,614,785
3,614,786
11 : 3,614,787
350– 1 : 3,614,188
3.5 : 3,614,189
3,614,190
3,614,191
3,614,192
7 : 3,614,193
3,614,194
13 : 3,614,195
58 : 3,614,196
96 : 3,614,197
3,614,198
105 : 3,614,199
150 : 3,614,200

350–160 : 3,614,201
3,614,202
3,614,203
161 : 3,614,204
171 : 3,614,205
179 : 3,614,206
184 : 3,614,207
214 : 3,614,208
215 : 3,614,209
278 : 3,614,210
285 : 3,614,211
3,614,212
299 : 3,614,213
351– 7 : 3,614,214
41 : 3,614,215
44 : 3,614,216
161 : 3,614,217
3,614,218
352–178 : 3,614,219
355– 3 : 3,614,220
3,614,221
8 : 3,614,222
30 : 3,614,223
53 : 3,614,224
85 : 3,614,225
356– 5 : 3,614,226
17 : 3,614,228
31 : 3,614,229
36 : 3,614,230
37 : 3,614,231
71 : 3,614,232
83 : 3,614,233
95 : 3,614,227
106 : 3,614,234
3,614,235
112 : 3,614,236
120 : 3,614,237
124 : 3,614,238
152 : 3,614,239
3,614,240
175 : 3,614,241
181 : 3,614,242
246 : 3,614,243
401– 28 : 3,614,244
101 : 3,614,246
132 : 3,614,245
199 : 3,614,247
292 : 3,614,248
408– 1 : 3,614,249
3 : 3,614,250
3,614,251
9 : 3,614,252
415– 23 : 3,614,253
36 : 3,614,254
100 : 3,614,255
143 : 3,614,256
176 : 3,614,257
205 : 3,614,259
208 : 3,614,258
416– 23 : 3,614,260
174 : 3,614,261
224 : 3,614,262
417– 7 : 3,614,263
49 : 3,614,264
62 : 3,614,265
79 : 3,614,266
206 : 3,614,267
237 : 3,614,268
253 : 3,614,269
293 : 3,614,270
312 : 3,614,384
379 : 3,614,271
423 : 3,614,272
418– 61 : 3,614,274
206 : 3,614,275
238 : 3,614,276
253 : 3,614,277
424– 20 : 3,613,617
431– 16 : 3,614,278
17 : 3,614,279
25 : 3,614,280
180 : 3,614,281
328 : 3,614,282
352 : 3,614,283

CLASSIFICATION OF DESIGNS

D 1– 99 : 222,323
D 4– 35 : 222,324
D 5– 4 : 222,325
222,326
222,327
D 8– 5 : 222,328
15 : 222,329
36 : 222,330
51 : 222,331
61 : 222,332
230 : 222,333
222,334
D 9– 47 : 222,335
87 : 222,336
115 : 222,337
222,338
222,339

D 9–158 : 222,340
D13– 1 : 222,341
222,342
222,343
222,344
222,345
D14– 3 : 222,346
30 : 222,347
222,348
D15– 8 : 222,349
222,350
11 : 222,351
D16– 1 : 222,352
D22– 29 : 222,353
D23– 42 : 222,354
150 : 222,355
D26– 1 : 222,356

D26– 5 : 222,357
14 : 222,358
222,359
222,360
222,361
222,362
15 : 222,363
D29– 1 : 222,364
23 : 222,365
D30– 1 : 222,366
D33– 3 : 222,367
222,368
19 : 222,369
D34– 3 : 222,370
5 : 222,371
222,372
15 : 222,373

D34– 15 : 222,374
D36– 8 : 222,375
D40– 1 : 222,376
222,377
D42– 7 : 222,378
D44– 26 : 222,379
29 : 222,380
D45– 4 : 222,381
D49– 10 : 222,382
22 : 222,383
D52– 1 : 222,384
3 : 222,385
222,389
6 : 222,386
222,387
222,388
D54– 4 : 222,390

D54– 12 : 222,391
D55– 1 : 222,392
D56– 2 : 222,393
9 : 222,394
222,395
222,396
D61– 1 : 222,396
D72– 1 : 222,397
222,398
D74– 1 : 222,399
5 : 222,400
24 : 222,401
D83– 1 : 222,402
12 : 222,403
D87– 3 : 222,404
222,405
222,406

D87– 5 : 222,407
8 : 222,408
D90– 20 : 222,409
D92– 1 : 222,410
222,415
222,416
222,417
26 : 222,411
222,412
222,413
222,414
222,418
222,419
222,420
D95– 3 : 222,421
222,422

GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

1 : 3,613,191	6 : 3,613,379	6 : 3,613,916	6 : 3,614,296	6 : 3,614,694	9 : 3,614,095
3,613,341	3,613,384	3,613,918	3,614,298	3,614,703	3,614,182
3,613,374	3,613,416	3,613,926	3,614,316	3,614,710	3,614,192
3,613,408	3,613,440	3,613,955	3,614,331	3,614,731	3,614,291
3,613,434	3,613,446	3,613,959	3,614,333	3,614,733	3,614,314
3,613,458	3,613,466	3,613,967	3,614,339	3,614,736	3,614,319
3,613,615	3,613,510	3,613,968	3,614,342	3,614,745	3,614,322
3,613,660	3,613,512	3,613,978	3,614,356	3,614,753	3,614,325
3,613,664	3,613,539	3,613,994	3,614,365	3,614,756	3,614,430
3,613,706	3,613,546	3,613,995	3,614,373	3,614,758	3,614,484
3,613,794	3,613,551	3,613,996	3,614,378	3,614,768	3,614,537
3,614,027	3,613,554	3,614,002	3,614,380	3,614,771	3,614,539
3,614,326	3,613,555	3,614,009	3,614,411	3,614,777	3,614,599
3,614,617	3,613,581	3,614,014	3,614,418	3,614,780	3,614,627
4 : 3,613,259	3,613,583	3,614,024	3,614,421	3,614,781	3,614,656
3,613,360	3,613,590	3,614,028	3,614,423	3,614,782	3,614,660
3,613,698	3,613,604	3,614,030	3,614,438	3,614,783	3,614,719
3,613,921	3,613,617	3,614,036	3,614,439	7 : 3,613,251	3,614,725
3,614,045	3,613,621	3,614,041	3,614,449	8 : RE.27,198	3,614,759
3,614,217	3,613,630	3,614,046	3,614,450	3,613,494	3,614,784
3,614,218	3,613,659	3,614,049	3,614,475	3,613,600	10 : 3,613,115
3,614,321	3,613,665	3,614,056	3,614,486	3,613,674	3,613,314
5 : 3,613,749	3,613,666	3,614,057	3,614,489	3,613,786	3,613,314
6 : 3,613,117	3,613,669	3,614,077	3,614,516	3,613,787	3,613,345
3,613,141	3,613,671	3,614,101	3,614,518	3,613,789	3,613,368
3,613,142	3,613,690	3,614,110	3,614,528	3,613,884	3,613,999
3,613,152	3,613,722	3,614,111	3,614,529	3,613,925	3,614,190
3,613,153	3,613,726	3,614,114	3,614,533	3,613,934	3,614,452
3,613,211	3,613,729	3,614,120	3,614,541	3,614,020	11 : 3,613,370
3,613,220	3,613,732	3,614,131	3,614,542	3,614,440	3,613,457
3,613,228	3,613,751	3,614,133	3,614,545	9 : 3,613,180	3,613,748
3,613,230	3,613,756	3,614,143	3,614,551	3,613,181	3,613,908
3,613,231	3,613,766	3,614,148	3,614,574	3,613,233	3,614,119
3,613,238	3,613,775	3,614,149	3,614,582	3,613,282	3,614,327
3,613,241	3,613,782	3,614,156	3,614,583	3,613,299	3,614,348
3,613,248	3,613,788	3,614,173	3,614,584	3,613,375	3,614,431
3,613,250	3,613,796	3,614,181	3,614,592	3,613,517	3,614,772
3,613,268	3,613,799	3,614,194	3,614,611	3,613,552	12 : 3,613,149
3,613,273	3,613,803	3,614,205	3,614,618	3,613,595	3,613,189
3,613,277	3,613,806	3,614,214	3,614,625	3,613,634	3,613,227
3,613,285	3,613,808	3,614,227	3,614,626	3,613,689	3,613,243
3,613,298	3,613,852	3,614,231	3,614,630	3,613,693	3,613,261
3,613,307	3,613,865	3,614,234	3,614,635	3,613,708	3,613,265
3,613,313	3,613,871	3,614,246	3,614,658	3,613,728	3,613,294
3,613,332	3,613,880	3,614,250	3,614,663	3,613,792	3,613,411
3,613,343	3,613,881	3,614,254	3,614,667	3,613,928	3,613,430
3,613,346	3,613,888	3,614,262	3,614,670	3,613,960	3,613,556
3,613,353	3,613,909	3,614,272	3,614,679	3,613,979	3,613,599
3,613,357	3,613,910	3,614,281	3,614,683	3,613,980	3,613,626
3,613,373	3,613,914	3,614,295	3,614,686	3,614,006	3,613,629

12 : 3,613,682
3,613,915
3,613,919
3,613,949
3,613,964
3,613,976
3,614,089
3,614,102
3,614,104
3,614,393
3,614,394
3,614,477
3,614,648
3,614,720
13 : 3,613,605
3,613,767
3,613,797
3,613,807
3,613,854
3,613,874
3,613,897
3,614,075
3,614,237
3,614,388
3,614,610
15 : 3,613,325
16 : 3,613,289
3,613,685
3,613,859
3,613,920
3,614,098
3,614,459
17 : RE.27,190
3,613,128
3,613,130
3,613,151
3,613,174
3,613,178
3,613,218
3,613,229
3,613,245
3,613,247
3,613,249
3,613,309
3,613,310
3,613,312
3,613,318
3,613,335
3,613,342
3,613,406
3,613,413
3,613,435
3,613,438
3,613,444
3,613,460
3,613,477
3,613,480
3,613,491
3,613,493
3,613,505
3,613,525
3,613,538
3,613,553
3,613,557
3,613,564
3,613,609
3,613,613
3,613,661
3,613,731
3,613,735
3,613,752
3,613,791
3,613,793
3,613,801
3,613,802
3,613,814
3,613,818
3,613,842
3,613,868
3,613,877
3,613,878
3,613,886
3,613,898
3,613,902
3,613,912
3,613,917
3,613,922
3,613,938
3,613,942
3,613,945
3,613,956
3,613,965
3,613,992
3,614,021
3,614,022
3,614,053
3,614,062
3,614,069
3,614,079
3,614,088
3,614,106
3,614,108
3,614,113
3,614,115
3,614,144
3,614,146
17 : 3,614,147
3,614,163
3,614,164
3,614,185
3,614,216
3,614,219
3,614,256
3,614,306
3,614,310
3,614,315
3,614,347
3,614,351
3,614,361
3,614,364
3,614,381
3,614,470
3,614,492
3,614,502
3,614,503
3,614,504
3,614,519
3,614,521
3,614,522
3,614,531
3,614,593
3,614,621
3,614,671
3,614,684
3,614,706
3,614,709
3,614,711
3,614,716
3,614,718
3,614,766
18 : RE.27,195
RE.27,197
3,613,120
3,613,125
3,613,143
3,613,214
3,613,219
3,613,364
3,613,390
3,613,506
3,613,548
3,613,580
3,613,725
3,613,757
3,613,839
3,613,966
3,613,969
3,614,064
3,614,067
3,614,107
3,614,130
3,614,145
3,614,259
3,614,300
3,614,309
3,614,570
19 : 3,613,154
3,613,237
3,613,253
3,613,254
3,613,263
3,613,287
3,613,451
3,613,641
3,613,753
3,614,591
3,614,619
3,614,628
3,614,697
20 : 3,613,503
3,613,508
3,613,515
3,613,691
3,613,972
21 : 3,613,184
3,613,656
3,613,683
3,613,970
22 : 3,613,288
3,613,381
3,613,628
3,613,891
3,613,923
23 : 3,613,355
24 : 3,613,136
3,613,302
3,613,338
3,613,377
3,613,394
3,613,589
3,613,593
3,613,594
3,613,619
3,613,675
3,613,779
3,613,935
3,614,253
3,614,286
3,614,292
3,614,366
3,614,403
3,614,433
24 : 3,614,509
3,614,639
3,614,640
3,614,642
3,614,673
3,614,680
3,614,779
3,614,787
25 : 3,613,138
3,613,146
3,613,224
3,613,240
3,613,260
3,613,264
3,613,266
3,613,385
3,613,387
3,613,441
3,613,450
3,613,482
3,613,528
3,613,651
3,613,657
3,613,709
3,613,747
3,613,759
3,613,772
3,613,907
3,613,940
3,614,179
3,614,199
3,614,206
3,614,238
3,614,241
3,614,269
3,614,283
3,614,313
3,614,358
3,614,412
3,614,463
3,614,523
3,614,534
3,614,557
3,614,571
3,614,587
3,614,622
3,614,643
3,614,653
3,614,662
3,614,664
3,614,740
3,614,741
3,614,743
3,614,773
3,614,776
26 : RE.27,192
3,613,132
3,613,133
3,613,160
3,613,169
3,613,197
3,613,201
3,613,216
3,613,222
3,613,223
3,613,242
3,613,267
3,613,303
3,613,359
3,613,388
3,613,431
3,613,436
3,613,437
3,613,465
3,613,472
3,613,479
3,613,484
3,613,486
3,613,524
3,613,560
3,613,561
3,613,566
3,613,568
3,613,570
3,613,571
3,613,584
3,613,624
3,613,700
3,613,715
3,613,717
3,613,730
3,613,776
3,613,820
3,613,828
3,613,829
3,613,830
3,613,846
3,613,869
3,613,882
3,613,904
3,613,957
3,613,983
3,614,016
3,614,038
3,614,052
3,614,055
26 : 3,614,060
3,614,065
3,614,070
3,614,125
3,614,127
3,614,128
3,614,129
3,614,153
3,614,158
3,614,172
3,614,183
3,614,187
3,614,209
3,614,266
3,614,334
3,614,359
3,614,367
3,614,368
3,614,371
3,614,410
3,614,434
3,614,441
3,614,538
3,614,550
3,614,575
3,614,690
3,614,698
3,614,701
3,614,708
3,614,712
3,614,730
3,614,749
3,614,762
3,614,778
27 : 3,613,140
3,613,283
3,613,317
3,613,331
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3,613,452
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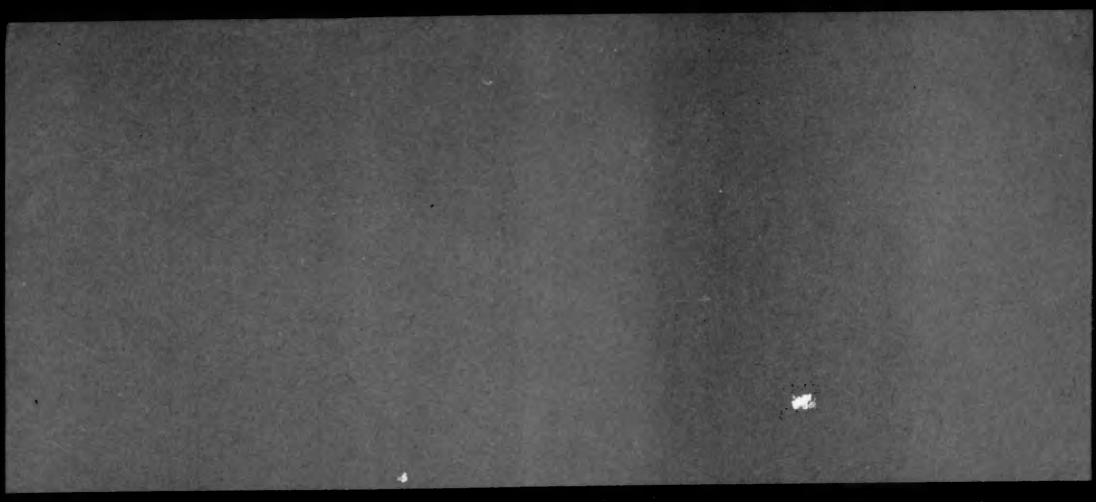

U.S. DEPARTMENT OF COMMERCE
Maurice H. Stans, *Secretary*

PATENT OFFICE
Robert Gottschalk, *Acting Commissioner*